

COMMERCIAL FERTILIZER

CONSOLIDATED
WITH THE
FERTILIZER
GREEN
BOOK

NEW, FREER-FLOWING ARCADIAN AMERICAN Nitrate of Soda

THE
top-dressing nitrogen
in top condition!

Arcadian



AMERICAN
NITRATE
OF SODA

New, big, square, triple-screened crystals of new-process ARCADIAN Nitrate of Soda provide all the advantages of quick-acting nitrate nitrogen and are easier to spread than ever before. This freer-flowing, greatly improved physical condition makes new ARCADIAN Nitrate the best nitrate of soda ever produced. Your customers will want it for top-dressing and side-dressing early this spring. Production is now under way, so ask us now about supplies of improved ARCADIAN Nitrate of Soda.

A-N-L® Nitrogen Fertilizer is another dependable nitrogen for side-dressing and top-dressing. This pelleted product provides 20.5% nitrogen—10.2% as nitrate and 10.3% as ammonia.

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APRIL, 1954

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The AMERICAN AGRICULTURAL CHEMICAL Co.

GENERAL OFFICE: 50 CHURCH STREET, NEW YORK 7, N. Y.

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One-Stop NITROGEN Service For Fertilizer Manufacturers



Nitrogen

FERTILIZER MATERIALS

LION ANHYDROUS AMMONIA—For formulation. A uniformly high-quality basic product. Nitrogen content, 82.25%.

LION AQUA AMMONIA—For formulation or acid oxidation. Ammonia content about 30%. Other grades to suit you.

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LION SULPHATE OF AMMONIA—For direct application or formulation. Large free-flowing crystals. Guaranteed nitrogen content, 21%.

TECHNICAL SERVICE—Lion provides special technical assistance for fertilizer manufacturers. Write to CHEMICAL SALES DIVISION for quick service.

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EL DORADO, ARKANSAS

COMMERCIAL FERTILIZER

ESTABLISHED 1910

April, 1954

Volume 88 No. 4

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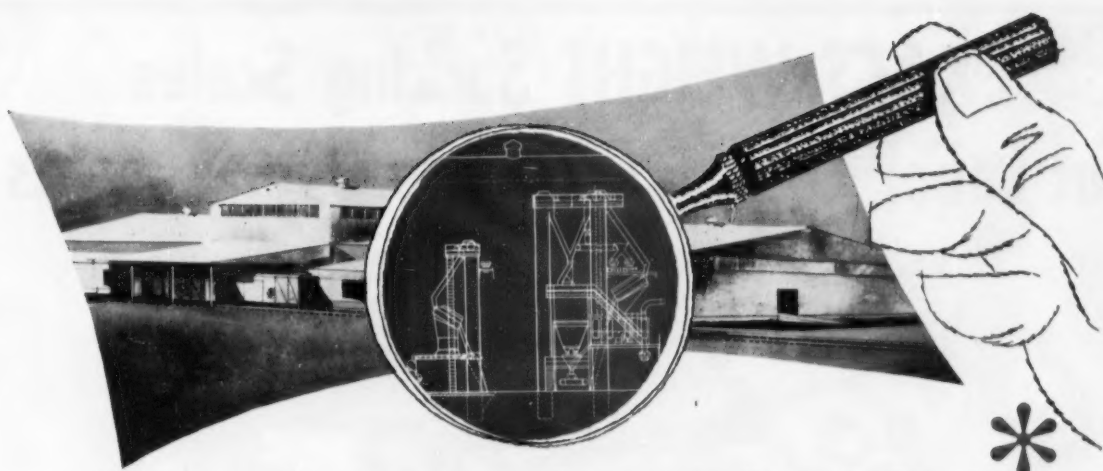
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COMMERCIAL FERTILIZER



Take advantage of Specialized Design for your **FERTILIZER PLANT**

Many years of experience in the fertilizer industry have given the Harte Company valuable knowledge about the development and application of the fertilizer processes. Extensive study and research have made Harte engineers cognizant of the over-all picture of fertilizer plant design, realizing that certain fundamentals must be followed while specializing each plant. Chemical processes, machinery, mechanical operations, production facilities are carefully studied and adapted to fit the needs of each individual fertilizer plant.

The diversified experience and 'know-how' of Harte engineers are available to aid you in your fertilizer plant design. If you plan to build a fertilizer mixing plant, or an associated plant, the Harte organization can handle your complete job or any part from original design to an operating plant . . . anywhere, assuring economy and speed.



Harte Engineers are Specialists in:

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- Triple Superphosphate Plants
- Single Superphosphate Plants
- Warehouses
- Granulating Plants
- Ammonium Sulphate Plants
- Storage Buildings
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284 TECHWOOD DRIVE, N.W., ATLANTA • NEW YORK • HOUSTON • MEXICO, D.F. • HAVANA • WASHINGTON, D. C.

April, 1954

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Simple to operate, the EXACT WEIGHT Sacking Scale has only two controls. It takes just four easy motions to attach a bag, fill it, weigh it, and release to conveyor. Built for hard service with agate bearings set in metal, alloy-steel pivots with hard chromed finish, and fittings of stainless steel and brass. Scale will handle multi-wall paper, paper-lined cotton, or burlap bags. Available with automatic valves. Write for full details today!



Exact Weight Scales

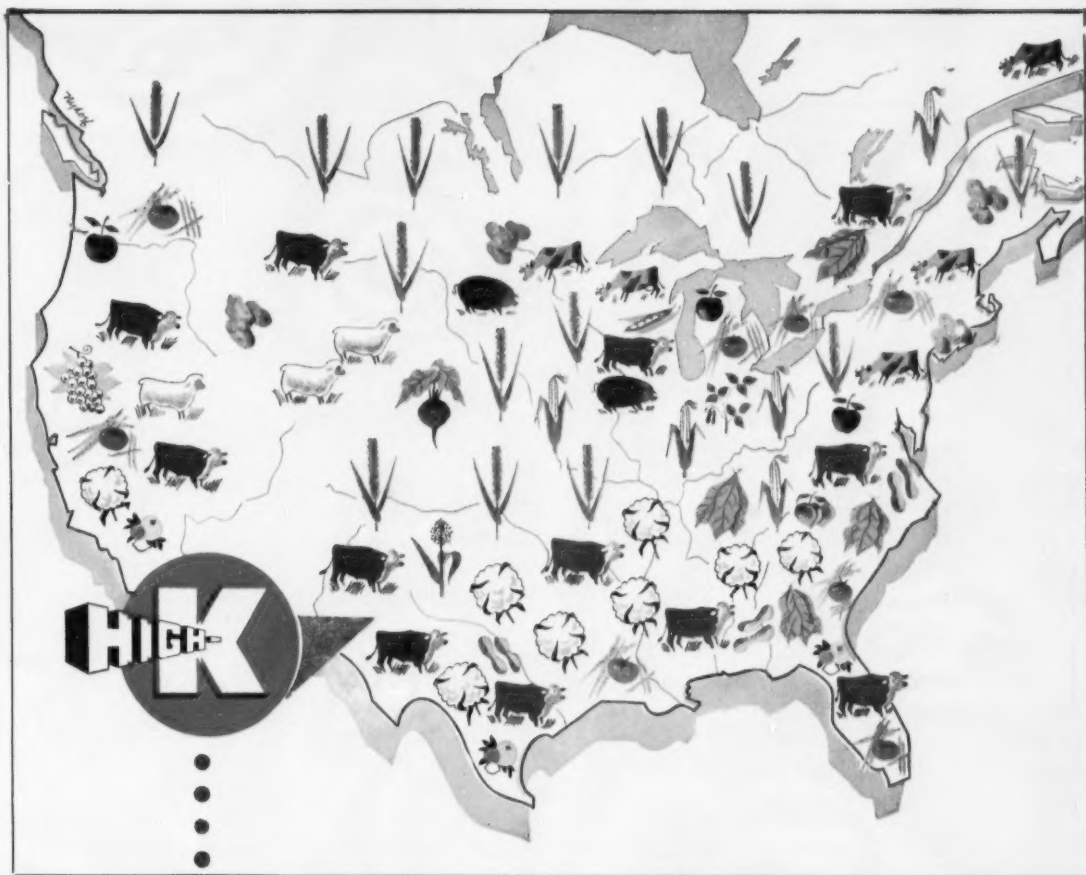
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Better cost control

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from coast to coast and
Canada

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...by using modern mining facilities and
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of Potash for plant food manufacturers.

Southwest Potash Corporation



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Potash

61 BROADWAY



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JUST AROUND THE CORNER

By Vernon Mount



\$27,000,000,000 FOR PLANTS, EQUIPMENT is not only a lot of money but a sign that business and industry are a lot more confident of the future than some of the captive economists. That is the amount of money earmarked to make 1954 the second largest year in expansion and improvement. 1953 was the record year.

THERE'S ANOTHER ANGLE to this expenditure. It represents a tooling up to produce goods more economically, as a means of loosening pocketbooks. That can mean reduced payrolls in the newly tooled-up industries, because machines will replace overtime, and some wage-earners.

TECHNOLOGICAL UNEMPLOYMENT has happened before. The wool-spinners of Liverpool smashed the Spinning Jenny because it put them out of work. But it was not long before machine spinning brought about a far greater need than ever for textile workers - because prices went down (profits went up) and more people bought more goods. It has happened many times since.

LOWER PRICES make markets. Markets are demand. Demand creates industrial production. Industrial production creates jobs. It may not be good politics to set off this cycle, because voters are ignorant of basic economics, but it is the road to firm prosperity, and continuance of America's growth.

Yours faithfully,

Vernon Mount

Complex fertilizer



Get in on the ground floor!

The circles on the map represent unclaimed territories for the production of complex fertilizer. The pin locates the only plant presently producing complex fertilizer by a continuous chemical process.

New economic frontiers don't remain undeveloped for long. There is still time to get a choice location before the rapidly moving trend toward high analysis complex fertilizer *completely engulfs the country*.

Get C&I's complex fertilizer plant using the PEC* patented carbonitric process that produces a su-

perior and stable pelleted product for less than any existing process.

C&I will provide a complete and integrated plant or any of the individual units (ammonia, nitric acid, complex fertilizer) for the production of complex fertilizer in any desired capacity. Plants are erected at a fixed price with productions and efficiencies fully guaranteed.

C&I can also furnish the latest type ammonium nitrate solutions and solids plants.

* Potasse et Engrais Chimiques



Specialists in



Processing Ammonia

THE CHEMICAL & INDUSTRIAL CORP.

CINCINNATI 26, OHIO

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A Better Multiwall Valve Bag FOR LESS!

Look at these B-FLEX benefits:

LOWER BAG COSTS . . . Save up to \$2.50 per thousand.

FASTER PACKING . . . LOWER PRODUCTION COSTS.

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CUSTOMER SATISFACTION . . . no loose, torn sleeves to get into the farmer's drill.

Ask your Bemis Man for the complete B-FLEX story.

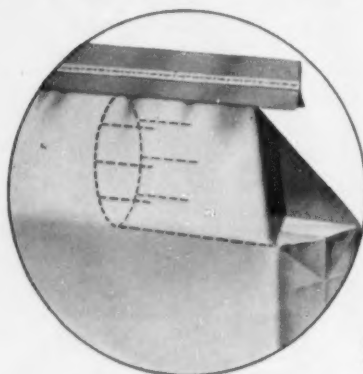
With Bemis B-FLEX Bags, you also get the same bonus you get with all Bemis Multiwalls—**BEMIS MULTI-COLOR PRINTING** . . . your brand at its finest on multiwall bags.

Bemis



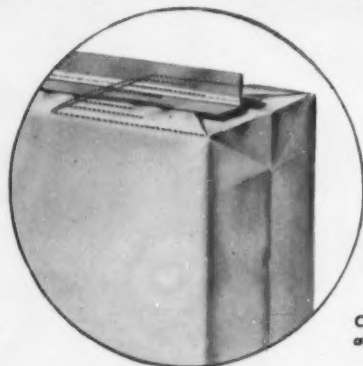
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Here's Why It's Better...

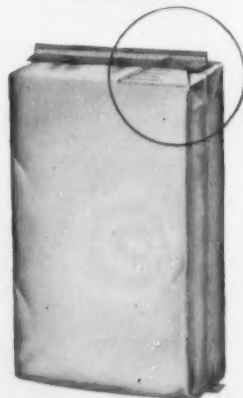


Open . . .
for filling

The FLEX Does the Trick...



Closed . . .
after filling





PAY DIRT



REG. U. S. PAT. OFF.

HIGRADE MURIATE OF POTASH 62/63% K_2O
GRANULAR MURIATE OF POTASH 60% K_2O MIN.

Southern Sales Office
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The addition of high-analysis fertilizers to the soil produces bumper results come harvest time. High-grade muriate of potash, an important component of these fertilizers, not only enriches the soil, but strengthens crop resistance to disease, producing healthier crops and larger yields.

The high-grade muriate of potash produced by the United States Potash Company has two distinct advantages in the mixing of high-analysis fertilizers. It has the greatest K_2O content and is free-flowing and non-caking—important factors in efficient production.

Adding high-analysis fertilizers to the soil adds up to better profits for farmer and businessman.

UNITED STATES POTASH COMPANY 30 ROCKEFELLER PLAZA
INCORPORATED NEW YORK 20, N. Y.

THE LOWEST PRICED

NEW



The new LEADER in LOADERS—only \$3395.⁰⁰

Here it is—the new 12-cubic foot, Model 20 Baker-Lull SHOVELOADER—the ideal *low-cost* answer to mechanization of bulk material handling.

Shovel loader Model 20 actually costs less than a year's pay for a laborer with a hand shovel! The low price is made possible by utilizing a mass-produced "power package"—including engine, transmission and drive axle. This saving to us is reflected in the extremely low selling price, *without sacrificing quality*.

Model 20 is designed and engineered for fast, efficient large volume performance. Although priced \$350 or more under any other loader in its class, we ask that you compare it with the highest priced—using any standards you wish.

Compare its construction of highest quality materials and components. Compare its proven,

dependable power unit, made for us by a leading builder of gasoline tractor engines.

Compare it for performance. Compare its 7-foot lifting height and 1500-lb. load carrying capacity with other makes. Compare it for speed: top travel speed 14 mph. Compare the natural and easily controlled bucket action for efficiency in digging, loading and carrying.

Compare for operator safety and convenience. Operator has full 360° visibility at all times. Moving bucket arms are always *in front* of him, instead of moving up and down beside him where they obstruct vision and are a constant hazard to life and limb.

Compare for versatility. Model 20 Shovel loader gives you top bulk handling efficiency for light materials, heavy loads or loads varying from light to heavy. It easily switches to lift forks, special buckets or crane hook attachments to perform many other jobs in your plant.

LOADER IN ITS CLASS

Baker-Lull model 20 SHOVELoader



UNLOADS BOXCARS: The maneuverability of Shovel loader Model 20 makes it ideal for unloading bulk materials such as foundry sand, dry chemicals, fertilizers, etc., from box cars with 6-foot doors.



HANDLES COAL: Shovel loader Model 20 saves many man hours in coal handling operations. Full hydraulic control of bucket means safe operation in close quarters.



BETTER DIGGING ACTION: Tiltback of bucket at ground level of 15° and automatic scooping action as lift arms are raised, provide the natural, easy digging and full-bucket operation that pays off in more work per hour.



LIFTS HIGHER—DUMPS HIGHER: Model 20 Shovel loader's 7-foot lifting height permits charging of high hoppers and better use of bin space by higher piling. Loading out scrap and loading high truck bodies is no problem.



LIFTS 1500 POUNDS EASILY: Lifting and carrying capacity of $\frac{3}{4}$ tons of material is about 500 pounds higher than most loaders in this class. Greater forward reach—full 48 inches ahead of front tires—means better positioning of loads in truck loading and piling.

THE BAKER-LULL CORPORATION

Formerly the Lull Corporation

406 WEST 90th ST. • MINNEAPOLIS 20, MINN.

A Subsidiary of The Baker-Raulang Company

THE BAKER-LULL CORPORATION,
406 West 90th Street • Minneapolis 20, Minn.

Please send full information on the Baker-Lull, Model 20,
12 cu. ft. SHOVELoader which sells for only \$3395.00.

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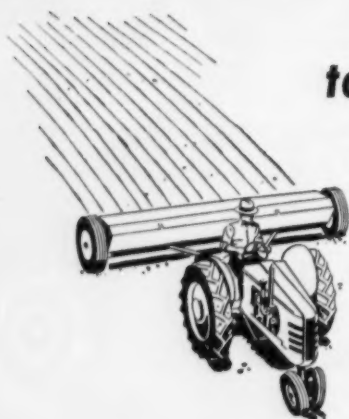


top-quality

REPUBLIC AMMONIUM SULPHATE

NOW AVAILABLE—BULK OR BAGGED—IN CARLOAD LOTS

to blenders of nitrogenous fertilizers



Republic's free-flowing Ammonium Sulphate is now available in bulk form or bagged for your fertilizer blends and mixes.

This high-capacity source of top-analysis Ammonium Sulphate is ready to ship to you in carload lots promptly and at regular intervals to meet your needs.

For more information on Republic Ammonium Sulphate write to:

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Export Department: Chrysler Building, New York 17, New York

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AMMONIUM SULPHATE



the ST. GOBAIN
process for the manufacture
of granulated
complex fertilizers

is
flexible!

So flexible, that one St. Gobain unit can produce practically any desired nitrogen-phosphorous-potash formulae, *without altering the equipment*. Shown below are just seven of the possible formulae produced by the St. Gobain Process.

Examine the simplicity of the flow diagram and you will understand why the capital investment is so low. Continuous automatic operation of the St. Gobain Process with its unusually high yields mean low operating costs with considerable savings in power consumption, maintenance and labor requirements.

In addition to the great flexibility and the simplification of the equipment, St. Gobain offers the following advantages:

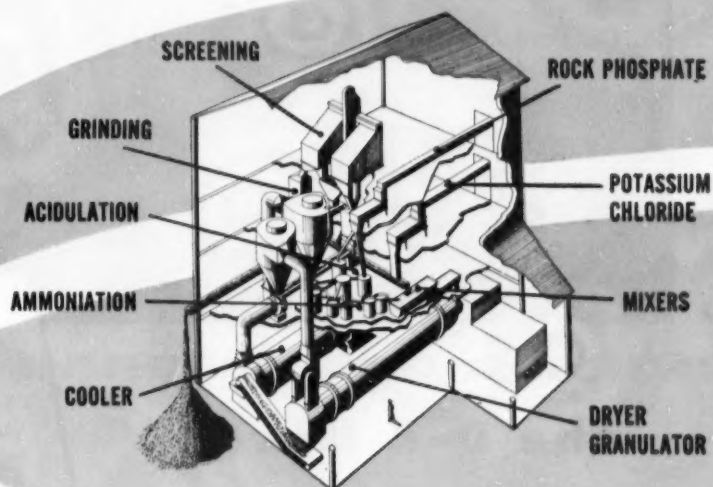
Phosphate rock grinding is unnecessary.

A very high nitrogen yield of 98:100.

Non-hygroscopicity of the fertilizers due to the absence of lime nitrate.

Can produce end product in any sized granules desired.

St. Gobain process has been in successful industrial operation for 11 years.

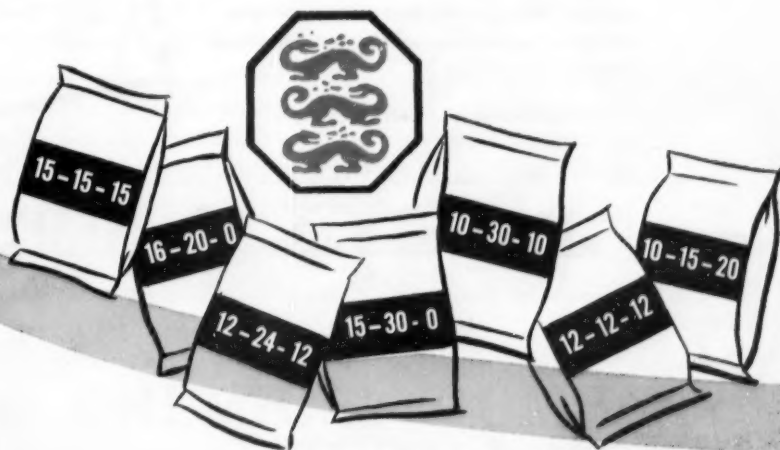


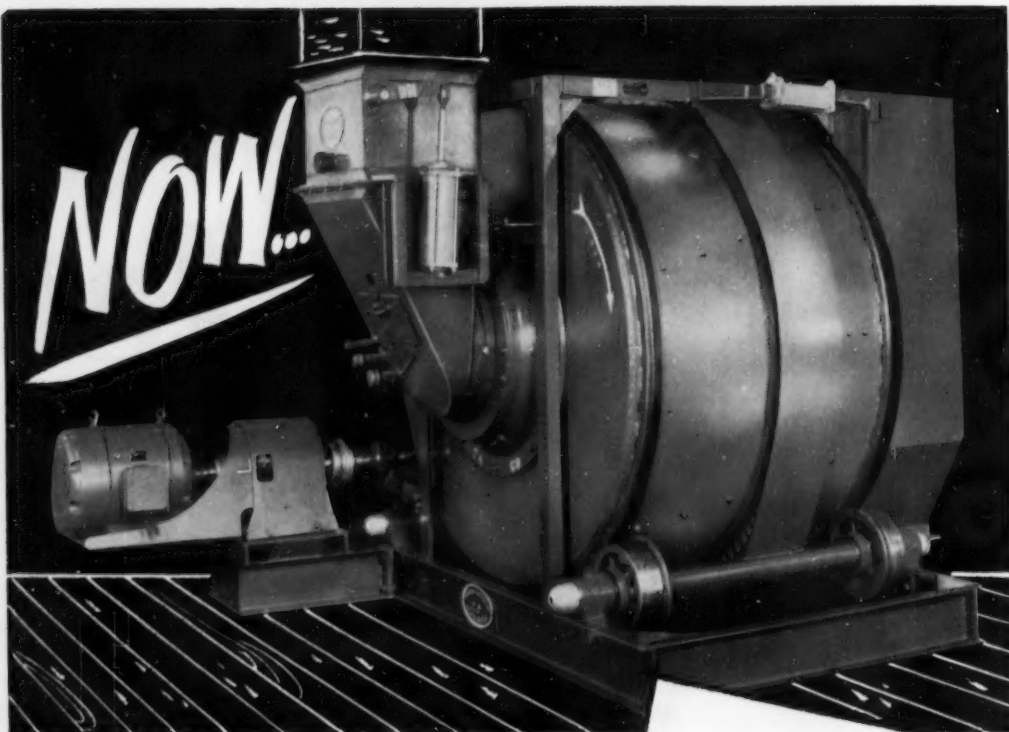
For complete information, write, wire or phone:

GENERAL INDUSTRIAL DEVELOPMENT CORP.

270 Park Ave., New York 17, N. Y.

AGENTS FOR ST. GOBAIN PROCESS.





the D-K Mixer

A new addition to the Davidson-Kennedy line of fertilizer machinery is the D-K Mixer. Available in one-half, one and two ton capacities, it is of sturdy, heavy-duty construction with high carbon, high wear resistant steel plate. Mixer flights consist of special alloy steel plates arranged to give complete mixing of dry and semi-dry materials in the shortest possible cycle. The new D-K Mixer, typical of all Davidson-Kennedy fertilizer equipment, will perform efficiently and economically and give a lifetime of trouble-free service. Write today for complete information.

Complete fertilizer design, engineering, fabrication and construction supervision service.

- ◆ Sealed mixing unit contains self take-up neoprene seal in inlet.
- ◆ Wheel bearings are sealed to keep grease in and dust out. Lubrication fittings are stationary and easily accessible.
- ◆ Direct drive is connected with flexible bearings to totally enclosed fan cooled motor. (optional)
- ◆ Charge and discharge gates are hand operated or air operated. (optional)
- ◆ Ample clean-out doors and manhole are provided for access to mixer drum.
- ◆ One ton mixer requires only 90" x 82" floor space.

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Automatic solution tanks

Shaker screens

Pulverizers

Clod breakers

Elevators

Conveyors

Mixers

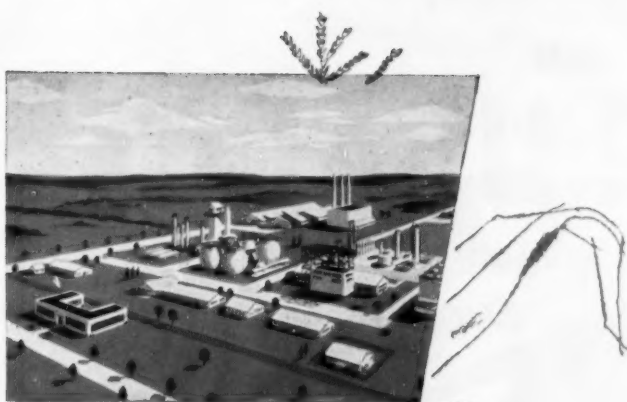
DAVIDSON-KENNEDY CO.

ATLANTA



GEORGIA

U.S.A.



**from
this
growing
'plant'**

... A RICH HARVEST FOR AMERICA



This young plant is growing fast. It will begin to bear fruit this fall. And the nation's industry and agriculture will reap the harvest — a harvest of high quality nitrogen products that will contribute to increased comfort and convenience for us all.

This new plant, located in Memphis, Tennessee, is designed to produce 72,000 tons of nitrogen annually, in the form of urea and anhydrous ammonia. It represents a reliable new source for these important chemicals.

Already, urea and ammonia occupy strategic positions in American industrial production — for both civilian consumption and defense. Advancing technology will increase the demands upon the nation's supplies as new fibers, resins, petroleum derivatives, propellants and pharmaceuticals are created. In agriculture, too, more and more urea and ammonia will be needed each year to raise the capacity of our soils for sustained high-level crop production.

Watch this plant grow — and be ready to reap *your* share of the harvest. A free 20-page booklet "Introducing Grace Chemical Company" tells the story in detail. Write for your copy.



GRACE CHEMICAL COMPANY

HANOVER SQUARE • NEW YORK 5, NEW YORK



Do The Job Faster!

When time is the important factor you will greatly reduce curing time by using Tennessee's SUL-FON-ATE AA9. Increase turnover and tonnage while maintaining top quality.

Use **SUPER ACID** for fast Superphosphate curing.

Technical service is available to help you with your problems.

ORGANIC CHEMICALS DIVISION

TENNESSEE



CORPORATION

617-29 Grant Building, Atlanta, Georgia



AQUAFIL! Offers You...

✓ BIGGEST SUPPLY ✓ BEST QUALITY

✓ LOWEST PRICE . . .

1



CONDITIONING AGENT FOR COMMERCIAL FERTILIZER—Aquafil is the product stabilizer that ends caking in the bag.

2



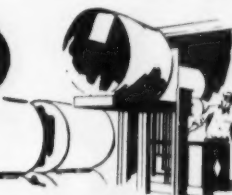
DILUENT FOR INSECTICIDES—With Aquafil you get high concentration which means savings.

3



COVERING AGENT FOR AMMONIUM NITRATE—High absorption qualities make Aquafil an effective agent.

4



RESIDUAL FILTERING AGENT IN PAPER INDUSTRY—Impurities rapidly filtered out by Aquafil's action.

5



INERT FILLER FOR INSULATION INDUSTRY—Aquafil offers stable, uniform filler for industry needs.

AQUAFIL PROPERTIES

Density: 9.6 pounds per cubic foot.

Fineness: 95.3% through 325 mesh.

Composition: Aquafil is amorphous diatomaceous silica.

Inertness: Used by many industries as inert filler.

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• More and more users of diatomaceous earth are turning to Aquafil . . . and finding it profitable. Aquafil offers you a high quality product, from North America's largest level deposit . . . and at less cost. It will pay you, too, when you look into the use of Aquafil as a means of improving your product, as it increases your profit margin. Next time you order diatomaceous earth . . .

Specify AQUAFIL!



AQUAFIL COMPANY

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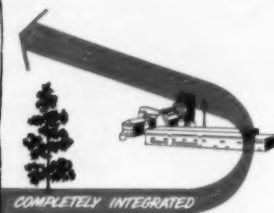
When you place your order with Albemarle, it is "our baby" . . . all the way.

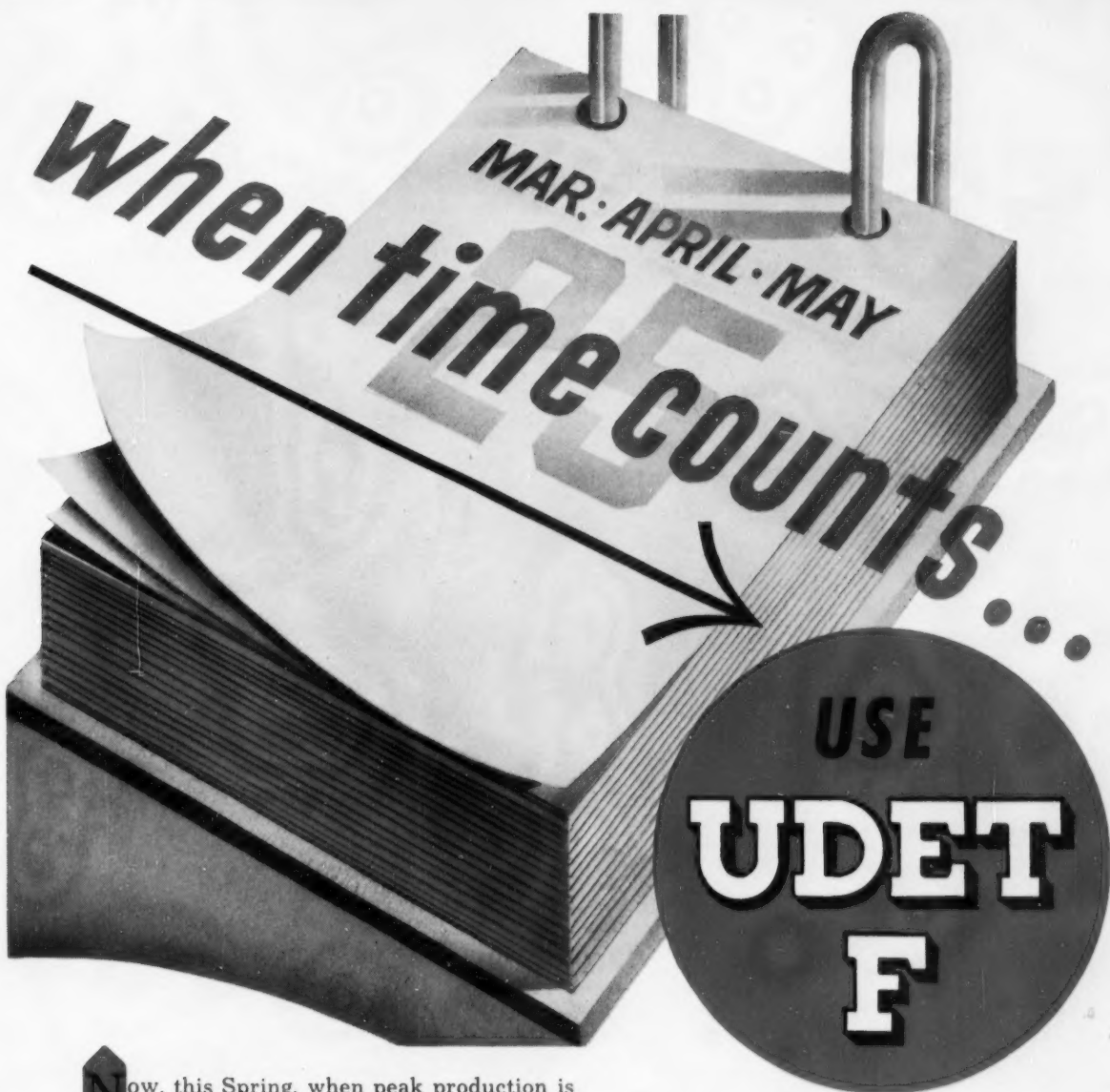


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MIDWEST SALES OFFICE: CHICAGO, ILLINOIS





Now, this Spring, when peak production is your goal, use UDET F and get: Faster curing. Easier handling of materials. Faster milling and screening. Minimum "down" time.

Maintain maximum production. And deliver a fully-cured product, practically free from caking, for continued customer satisfaction.

Use UDET F, the *one* surfactant *proved* by fertilizer makers in conclusive tests!

UDET 95F — a 95% active granular powder
UDET 50F — a 50% active free-flowing liquid

IN ACIDULATION, UDET F is up to 3-times more effective than competing products in the presence of calcium ions.

IN AMMONIATION, UDET F, being instantly soluble, disperses completely in the mix. Permits higher absorption of ammonia.

IN GRANULATION, UDET F inhibits cake build-up and equipment fouling. Increases production through less "down" time.

IN AMMONIUM SULFATE PRODUCTION, UDET F lowers moisture content. Provides anti-caking properties.

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in

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Fertilizer manufacturers from coast to coast are

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Sul-Po-Mag is a properly balanced combination of *sulfate of magnesium* and *sulfate of potash*. Both are water-soluble and immediately available to growing crops. *Sul-Po-Mag* is the most economical and practical way to supply water-soluble magnesium in mixed fertilizer. So put it *in* the bag and put it *on* the bag: Nitrogen, Phosphate, Potash, *Magnesium*.



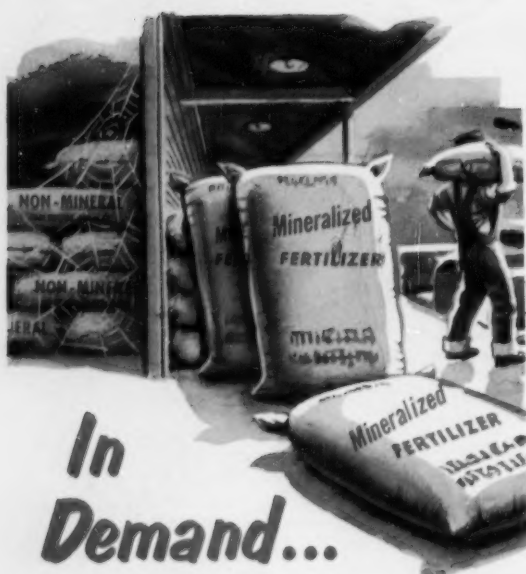
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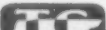


Growers of today are insisting on completely mineralized fertilizer. They insist on mineralized fertilizer because results have proven conclusively that such fertilizers produce healthier plant growth, greater crop yield, and increased dollar profits per acre.

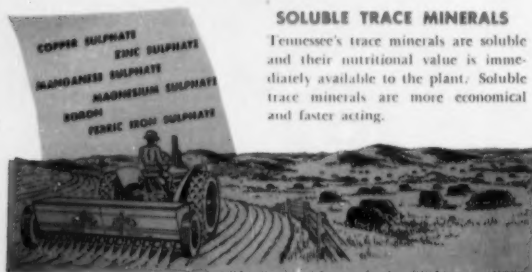
The addition of the essential minerals to your fertilizer will stimulate fertilizer sales, produce more satisfied customers, and increase tonnage and dollar profits.

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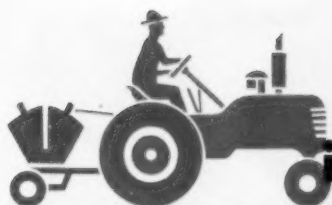
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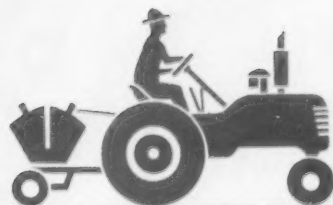
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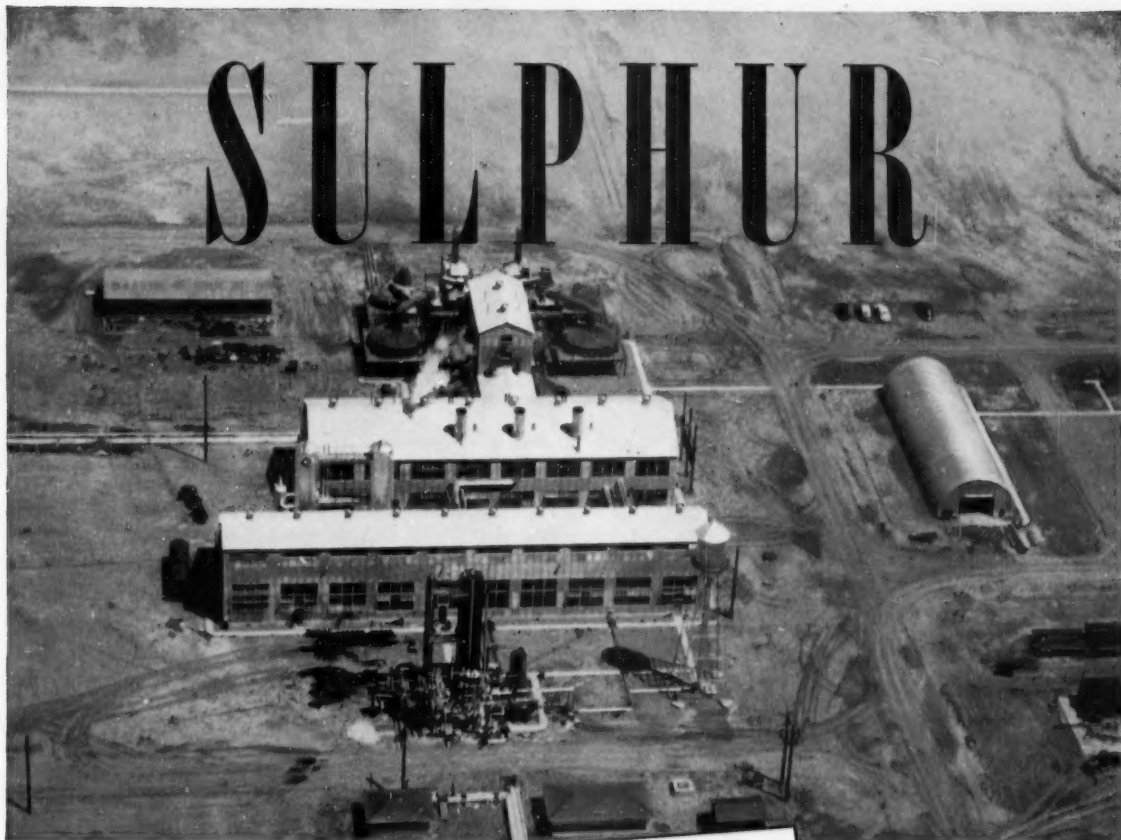
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Most of the natural gas coming from fields on the East slope of the Rocky Mountains contains hydrogen sulphide rendering the gas "sour." The recovery of the sulphur from this gas, thereby

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Both metallurgy and chemistry combine in Canada, Norway, Sweden, Spain, Portugal, Germany, Great Britain, Holland and Egypt to produce substantial quantities of elemental sulphur from sulphides of hydrogen, iron and oil shale.

This company has the largest single unit in the world at Worland, Wyoming, recovering elemental sulphur from hydrogen sulphide contained in sour gas.

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Protect Our Science Workers

Two organizations have written us lately concerned with the problem of preserving the progress of science in this country. The Future Scientists of America Foundation of the National Science Teachers Association, 1201 Sixteenth Street, N.W., Washington 6, D.C. wants help in finding summer jobs for America's science teachers.

The American Society of Agronomy warns against the potential waste of the special knowledge of American agronomists in case of another war. They have published a detailed study of the problem, which they offer to anyone interested who will write Dr. C. L. W. Swanson, Head, Department of Soils, Connecticut AES, New Haven. This was published in the January issue of the Society's agronomic manpower resources committee.

"Crop and soil scientists," said Dr. Swanson in his statement, "are not asking that they be granted special privileges. All that they ask is that their talents and training be used in jobs for which they are trained, either in the military or in a civilian capacity, and not indiscriminately wasted, as all too often was the case in World War II.

"It isn't a question of whether there will be too many crop and soil scientists with many not having anything to do in their field or specialty, for we now have a shortage," he emphasized. "With a stepped-up tempo in wartime, the need for agronomists will be even greater."

Swanson pointed out that food is an essential item of warfare for feeding the Armed Forces and civilian population of both this and allied countries. Warfare is wasteful of food, hence more food needs to be produced. Since it is not possible to bring large acreages into production, the practical solution is to increase the production per acre. Professional crop and soil scientists are needed for accomplishing this increased food production.

The Future Scientist plea is based on the need for science training of

It Seems to Me

by BRUCE MORAN



Elevators, bins, warehouses, refrigeration plants, the holds of idle ships—all are jammed with products of the farm. It costs the taxpayer something like \$20,000 an hour to keep them there. And all because the farmer's ability to produce has out-run the nation's ability to consume.

A problem—but a lot better than starvation.

We still need to anticipate the "Fifth Plate" that lies ahead of us—the extra mouths that must be fed. We cannot let down on our efforts to teach the farmer all we can learn that will make him ever more efficient.

And that lends emphasis to two pleas which came to us, almost in the same mail, concerning the future of our scientific workers and teachers. The column to your left goes into these two points, and is worth some very serious thought by our industry, which owes so very much to the chemist and the agronomist.

On some of this we can take action now . . . on the rest, it seems to me, we should stand by, at attention, with a will to act when, as and if the time comes.

the young to avert a shortage of these skills in the future; on the value of holding science teachers in their field by supplying extra income; on the value of giving those teachers first-hand, practical, working knowledge of the application of their subjects to industry; on the fact

that they have able, trained minds, and can contribute much to those who hire them.

They suggest you call your school superintendent, and discuss the problem with him; or call the teachers direct for a discussion of the possibilities.

INDUSTRY CALENDAR

Date	Organization	Place	City	State
May 6	N. C. Safety	Sir Walter	Raleigh	N. C.
May 7	Md. Safety	Lord Baltimore	Baltimore	Md.
May 21	Va. Safety	Roughton Pontiac Hall	Norfolk	Va.
June 10-12	APFC	Homestead	Hot Springs	Va.
June 14-16	NFA	Greenbrier	White Sulphur	W. Va.
July 20-22	Pacific Conference	Klawath Falls AES		Oregon
Oct. 18-19	Fertilizer Section	LaSalle Hotel	Chicago	Ill.
Nov. 10-12	NFA	Hollywood Beach Hotel	Hollywood	Fla.
Nov. 15-16	CFA	del Coronado Hotel	Coronado	Cal.
Dec. 2-3	Cotton Insect	Adolphus	Dallas	Texas



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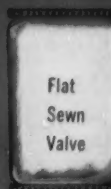
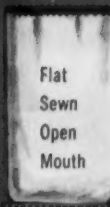
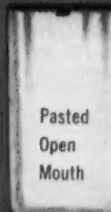
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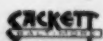


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"No bed of roses" SAYS THIS COUNTY AGENT

JAMES D. HUTCHISON*

The County Agricultural Agent is the link between his State Agricultural College, the U. S. Department of Agriculture, and his farmer constituents. The job of carrying agricultural methods developed by these two agencies direct to farmers, by means of meetings, demonstrations and specific assistance, is said to be the greatest adult teaching enterprise in the world.

After having served in this capacity in Luzerne county for one-third of a century, I can truthfully say that being a County Agent is not "a bed of roses." True, today the Agricultural Extension Association is respected and accepted by most farmers, and its work is appreciated. In the early days of Extension work, County Agents were regarded by most farmers with skepticism and by some with scorn. The gradual disappearance of this early skepticism has made life in the Agricultural Extension program much easier.

Now, for the "bed of roses."—True, one does not have to do manual labor, but he must, if he is to succeed, put plenty of thought, time, and energy into his work every waking hour of his time during each of the 365 days of the year.

Each day, each year, brings new problems into this changing world of agriculture. Things we suggest this year as the proper methods or materials to use seem certain to be outmoded next year by new chemicals or pieces of equipment. A County Agent must have an open mind and be alert to changing conditions. He must be ahead of the band, for newspapers, periodicals, radio, and television also inform our patrons, and farmers are alert. One must lead instead of follow.

To be a good County Agent, one must be cautious and diplomatic at

all times. By this I don't mean that one should be namby-pamby and straddle the fence on important issues. I mean that each farmer and member of his family has individual problems. One always must be aware that a problem which looks small to you may be of tremendous proportions in the eyes of the farmer presenting it. So, treat each problem as presented with respect and thoroughness, and try to solve it.

One always must make as good impression as possible to farmers and city folks alike. To a city lady the "bugs in her petunias" may be her big problem. Be careful to give her proper consideration, for lack of consideration may build up disrespect. A satisfied customer is best, for a dissatisfied customer can do much harm and break down confidence in the Extension program.

A County Agent must have a co-operative and long-suffering wife, or remain single "a la Dutch Bucher." For, if a wife is non-cooperative in her husband's endeavors as a County Agent, she will be discontented with the long evenings she has to spend alone or with the children.

In conclusion, being a County Agent has been pleasant lifetime work for me. I feel that while material gains are not nearly so remunerative as in many businesses, a County Agent, if he is thrifty and his wife is careful, can accumulate a small estate and keep the wolf from the door in the eventide of life.

What I cherish most, as the result of Agricultural Extension activities, is the results I have accomplished in improving farm and home life. Above all, I appreciate the host of friends that I have accumulated through the years. They mean more to me than any material gains that I have accumulated. You cannot buy happiness with wealth, but through true friends you can have happiness without cost.

*County Agricultural Agent, Luzerne county, and President of the Pennsylvania County Agricultural Agents' Association in "Science for the Farmer" published by The Pennsylvania State University.

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FOR OVER 50 YEARS WE HAVE SERVED ONLY THE FERTILIZER INDUSTRY.

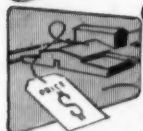
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We assist you in the important matter of site selection for your new plant including determination of subsoil conditions.



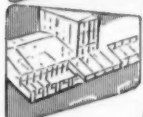
2 Plant Investment

We tell you before the contract is signed exactly how much the plant will cost. We protect you against unknown "cost plus" work.



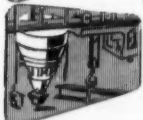
3 Plant Design

We custom-design the building and all production equipment to meet the particular needs of your area of distribution. Further, we leave no stone unturned to incorporate the highest possible degree of production efficiency based on our wealth of specialized "know-how."



4 Building Construction

We construct the building from foundations to roof using the best materials obtainable in each component part. We include all electric power and lighting required including a power room, in which are located all motor controls for protection against usual dust and moisture conditions.



5 Equipment Manufacture

We fabricate in our own shops production equipment of the very latest design. Upon arrival at the site, we install this equipment with highly skilled men under the supervision of thoroughly competent field engineers. Upon completion of this work, each component part is thoroughly tested prior to the plant's initial operation.



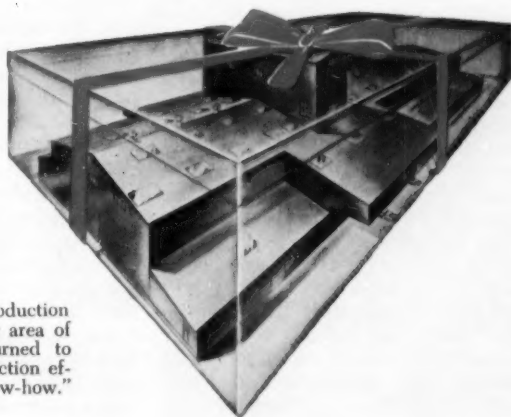
6 Guaranteed Performance

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Nitrogen Solutions

WITH A NEW TWIST

By BORDEN S. CHRONISTER
Chief Agronomist, Southern District
Nitrogen Division
Allied Chemical & Dye Corp.

"Nitrogen Solutions are the easiest way to put on nitrogen," "Solutions can be applied more rapidly and cheaper," "Nitrogen Solutions are the best all-round nitrogen materials." This is the constant refrain heard from farmers who have tried nitrogen solutions on a field scale. Even though their large scale use for direct application to the soil began only a few years ago, their growth has been phenomenal. There can be only one reason for this and that is—liquid nitrogen materials have proved their utility, economy and practicality. Many hundreds of tank cars have already moved to dealers and distributors over a wide area, and the demand is growing day by day. Liquid nitrogen materials have proved themselves in the face of the most exacting standards set up by practical farmers. Whether used for top-dressing, side-dressing, or plowed under, they have proved to be equally as efficient as any of the solid forms of nitrogen commonly used.

Farmers who are considering the use of liquid nitrogen materials may wonder about the difference in Ni-

trogen Solutions and Anhydrous Ammonia. The term, Nitrogen Solutions is applied to a group of liquid nitrogen materials made from an aqueous solution of one or a combination of two of the following materials, ammonium nitrate, urea, nitrate of soda and ammonia. Some of these solutions contain no ammonia and have no pressure. Others which contain some ammonia, will generate a low pressure at 104°F.

Anhydrous ammonia, sometimes referred to as a liquid nitrogen, is a gas at atmospheric pressure and becomes a liquid only under high pressure. It requires special equipment for storage and application. Anhydrous ammonia has been extensively used for several years as a source of nitrogen for crops, particularly in the Mississippi Delta, the West and more recently in the Midwest. Because of its high pressure, the scope of its use is limited to more specific soil types and topographic conditions.

On the farm experience has demonstrated that nitrogen solutions are excellent for top-dressing and side-dressing corn, cotton, small grains, pastures, grain sorghums and fruits. In fact, they can be used on the same crops to which the solid forms of nitrogen are ordinarily applied. They supply the same ammonia and nitrate forms of nitrogen as found in the solid nitrogen materials.

The use of solutions as a source of nitrogen is not new. Indirectly farmers have used them for years as part of the nitrogen in their complete fertilizers. Many fertilizer manufacturers have used solutions for almost twenty years as a source of nitrogen in their mixed goods. Ammoniating solutions have enabled manufacturers to add nitrogen to their fertilizers more economically and more efficiently and at the same time, to produce a better conditioned product.

Although nitrogen solutions have been used by farmers for years in mixed fertilizers, the "new twist" comes in their direct application to the soil as a top-dressing or side-dressing material. More than a decade ago engineers for the Nitrogen Division of Allied Chemical & Dye Corporation built experimental equipment for applying nitrogen solutions as side-dressing to sugarcane. The lack of proper application equipment and shortages of materials induced by the war, served to bottle up the development at that time. It was not until 1951 that nitrogen solutions for direct application came back into the picture. In the spring of that year a tank car shipment, 10,000 gallons of Uran, 32 percent nitrogen, went to the farm of Charles Schenk, near Vincennes, Indiana. It was used on 259 acres of corn at the rate of 100 pounds of nitrogen per acre. This side-dressing

Side-dressing corn with nitrogen solutions in North Carolina. A depth of 2 or 3 inches is usually sufficient for the low-pressure solutions.



COMMERCIAL FERTILIZER



Despite an unusually dry season nitrogen solution side-dressing made the difference in this corn yield.

application was in addition to the basic application of 8 pounds of nitrogen, 100 pounds of phosphoric acid and 100 pounds of potash per acre. The results were excellent. Since then hundreds of distributors in various sections of the country have set up to handle solutions.

Farmers who have tried Nitrogen Solutions during the past three years claim these advantages:

1. No bags to lift and carry; less labor needed to handle.
2. Non-hazardous—can be handled by the usual farm laborer.
3. More rapid application—40 to 300 acres per day depending on the crop and type of equipment.
4. More even distribution.
5. Crop response more certain and more rapid.
6. Can be applied at a shallow depth—even on the surface in case of non-pressure solutions.

Even though most of the horse-drawn farm implements, hay forks, chopping hoes and milk stools, have been scrapped, not much has been done in the past years to mechanize the back-breaking job of applying fertilizers. However, it seems that a new era has arrived for users of nitrogen. With the advent of nitrogen solutions, physical labor is no longer required to handle the nitrogen fertilizer materials. With a nurse tank mounted on a truck or trailer, the pump does all the lifting.

Nitrogen solutions now being used for direct application to the soil are supplied chiefly by the Nitrogen Division, Allied Chemical & Dye Corporation. These materials can be conveniently classified on the basis of their physical characteristics into Non-pressure and Low-pressure Solutions.

Non-Pressure Solutions: There are three solutions in this group ranging in analysis from 20 percent to 32 percent nitrogen. They contain no free ammonia, have no pressure and can be applied to the surface of the soil without loss of nitrogen. The trade names for these solutions are Uran, Feran and Sodan. They have been applied extensively to small grains and pastures and are becoming more and more popular for row crops because of the ease and rapidity with which they can be applied. They may be used on any type of soil and on any type of topography where the solids are normally applied. From 40 to 300 acres per day can be covered, depending upon the equipment and accessibility of the fields.

Feran has recently attracted national attention relative to its use in conjunction with weed control in corn. Experimental work has been recently released showing that Feran mixed with a small amount of low volatile 2-4D ester and a wetting agent, not only served effectively as a nitrogen side-dressing, but gave

excellent weed control in corn. This research opens up vast new possibilities for the use of Feran and possibly other nitrogen solutions along this line.

Low Pressure Solutions: This group also contains three solutions with the analysis ranging from 37 percent to 41 percent nitrogen. These solutions are made by combining ammonium and aqua ammonia in varying proportions. Pressures range from none up to 16 pounds per square inch at 104°F. Solutions in this group sold under the trade names of Nitrana 4, 2A and 3.

Since these materials contain a small amount of free ammonia, it is desirable to apply them under the surface of the soil to prevent nitrogen loss. A depth of 2 to 3 inches is usually sufficient. By placing the nitrogen in the root feeding zone, it is available to plants even in the driest weather. These low Pressure solutions have been extensively used on row crops, both in the South and Midwest. They can be easily and conveniently applied at a shallow depth between the rows in the loose soil.

Both the Non-pressure and Low-pressure solutions are being used extensively for spraying on corn stalks, grain stubble and other plant residues before plowing. This helps speed decay, therefore, increasing the organic matter in the soil. It has been found that under certain conditions, sufficient nitrogen can be applied to crop residues to take care of the corn nitrogen needs for the entire growing season.

Each solution has been designed to do a particular job depending upon the crop, soil, weather, topography and other environmental factors. This fact should be taken into consideration when selecting a solution for a given crop in a particular locality. While price is an important factor it would be unwise to select a nitrogen solution purely on the basis of cost per unit of nitrogen. Other factors such as its agronomic efficiency, physical properties, amount and type of nitrogen and the required method of application, might sometimes offset the advantages of the initial lower cost. For example, the Low-pressure solutions can usually be purchased at a lower

Applying a Low-pressure nitrogen solution into the soil for pastures in North Carolina. This method of application is good, but it is much slower and requires more power than the surface application of the non-pressure materials.





Top-dressing pastures with Feran by airplane.

price per unit of nitrogen than the non-pressure materials, but to apply the Low-pressure solutions to pastures would require subsurface application, more tractor power, more gasoline and time, thus offsetting the advantages of a cheaper price.

Aqua Ammonia, which is anhydrous ammonia dissolved in water, is gaining in use, especially in the West. A 30 percent solution of aqua am-

monia contains about 25 percent nitrogen and has a pressure of 11 pounds per square inch at 104°F.

Nitrogen Solutions are corrosive and should be handled and stored in non-corrosive metals such as aluminum and stainless steel. The Non-pressure solutions can be stored in ordinary steel tanks, but as a rule the life of these tanks would be relatively short.

The lack of adequate and properly designed application equipment constituted the biggest bottleneck in the use of nitrogen solutions in the beginning. Since the first car of solution was applied, new application equipment has been designed and old equipment improved. The new equipment, made of non-corrosive materials, has licked the problem of corrosion and vapor locking which first plagued application efforts.

Application equipment for nitrogen solutions can be purchased as a unit, either tractor mounted or a trailer type. A unit consists essentially of a tank, pump, boom or injection blades, and accessories needed for mounting. Various types of pumps can be used. However, where close accuracy in rates of application is desired, a metering pump is recommended. Metering pumps give a uniform rate of application regardless of the speed of the tractor. For use with non-pressure solution, a gravity-flow unit may be used. The rate of application with this type of equipment is determined by the speed of the tractor.

The cost of equipment varies according to type, kind of pump, size of tank and number of accessories. Equipment for subsurface application will usually cost more than the surface application type because of the heavy tool bar and injection blades required. Non-corrosive units equipped with 75 to 100 gallon tanks and metering pumps capable of treating five rows, range in price from \$450 and \$550. This type of equipment can handle either the Low-pressure or non-pressure solu-



Top-dressing pastures with non-pressure nitrogen solutions. Equipment of this type is also used for applying non-pressure solutions to row crops by spraying them on the surface of the soil between the rows.

Filling the tractor applicator tank from the nurse tank. Shown in the photo from left to right are Bill Stevens and Tommy Ashford of Liberty Manufacturing Co., Red Springs, N. C. and the author.



tions. A two-row, gravity flow unit for use only with the Non-pressure solutions, will cost around \$125 with a 50 gallon tank.

In addition to application equipment, a 500 to 1000 gallon field tank or "nurse tank" is needed to supply the applicators in the field from the farm storage or a near bulk station. Some farmers use the nurse tank to haul solutions from bulk stations as they are needed on the farm. Others have set up on the farm storage and order their nitrogen solutions delivered to the farm.

For farmers who do not have the necessary application equipment, custom applicators are available in most areas. This service is especially attractive to farmers who are short of labor, or do not wish to make the necessary investment in application equipment. Custom rates range from \$1.50 to \$3.00 per acre, depending on the crop to be treated. Some custom applicators charge a flat rate for a specific amount of nitrogen applied.

The Non-pressure solutions have been successfully applied by airplane to small grains and pastures. This method of application, no doubt, will gain prominence as equipment and other technical problems are worked out.

Nitrogen solutions applied directly to the soil are no substitute for mixed fertilizers. They serve only as another nitrogen material which farmers may find more efficient, and more economical in their mechanized system of farming. Where the use of liquid nitrogen and nitrogen materials have been expanded rapidly, the use of other fertilizer materials have gone up proportionately as fast. It is axiomatic to state, that the more nitrogen used, the more phosphorus, potash and other elements will be needed to balance the increased removal by the higher crop yields.

Nitrogen solutions for direct application to the soil is another step forward, giving the farmer another modernized tool for use in his fight for more efficient and more economical production.

NITROGEN PRODUCTION SURVEY

United States producers of nitrogen have reported to the Business and Defense Services Administration, U. S. Department of Commerce, that they can produce nearly 16 percent more ammonia under emergency conditions than the industry's rated capacity, disregarding costs and efficiencies and with some bottlenecks removed, it was announced March 12.

The information was obtained by BDSA at the request of the nitrogen industry at a special industry advisory conference held on February 16, 1954, to discuss the recent upward revision of the nitrogen goal to 3,500,000 tons domestic capacity by January 1, 1957.

Total nitrogen supply that would be available by 1957 under the conditions enumerated in the BDSA survey, and including by-product nitrogen, organic waste, and projects certified under the nitraphosphate program is over 3,800,000 tons. A breakdown of this figure is as follows:

	Short Tons Nitrogen	
Reported rated (ammonia) capacity, 2/15/54	2,233,600	
New (ammonia) capacity under construction	* 648,100	
	<hr/> 2,881,700	
Maximum (ammonia) production that could be attained from facilities existing and under construction disregarding efficiencies and costs	3,164,100	
Percent in excess of rated capacity		9.8%
Maximum production (of ammonia) that could be attained with some minor modifications of equipment and removal of bottlenecks	3,339,100	
Percent in excess of rated capacity		15.8%
Supply from by-product and organic wastes (Chemical and Rubber Division estimate)	265,000	
	<hr/>	
Total Attainable Domestic Supply of Nitrogen from Facilities Existing and Under Construction	3,604,100	
Additional Certified Projects not Under Construction	230,100	
	<hr/>	
Potential nitrogen supply—1957	3,834,200	
*Includes reactivation of Louisiana, Missouri Ordnance Works		
Industry's ability to achieve the maximum production indicated is confirmed by company data showing plant operations at 5 to 18 percent above rated capacities during various periods of the past two years.		

Kentucky Tour May 4-6

The 1954 Green Pastures Spring Tour has been scheduled for May 4, 5, and 6. Stops are planned at five or six different farms. The general plan is to stop at one farm in the morning and one in the afternoon of each day.

The tour this year is the fourth which has been held in connection with the Green Pastures Program and since all portions of the state have been fairly well covered, or will have been with the completion of this one, the Spring tours may be discontinued after this year according to B. W. Fortenbery of the Kentucky AES.

Udet Appoints

Thompson-Hayward

The appointment of Thompson-Hayward Chemical Co. as mid-western distributors in the agricultural field for Udet F surfactants has been announced by B. R. Bryant, general manager of Universal Detergents, Inc., Long Beach, California. Local warehouse stocks of UDET F, an alkyl aryl sodium sulfonate, are being maintained by Thompson-Hayward with service from their headquarters at 2915 Southwest Blvd., Kansas City, Mo., and their 16 branch offices.

SAFETY.....

FERTILIZER SAFETY SECTION MEETS IN LOUISVILLE

When the Southern Safety Conference met in Louisville, Kentucky March 7-9, the Fertilizer Section devoted 2 days to discussion of their mutual problem: Ways and means to reduce the high cost in man-power, morale, money and insurance premiums which has too long been part of the operation of the various types of plants which make up the fertilizer industry.

Mike Ellison, protection superintendent of Mississippi Chemical Corporation, chairman of the section, could not be there—but his good work spoke for him, as witness the box on page 75 of this issue which shows what is being done in the plant which is his safety responsibility. So Curtis Cox, Virginia-Carolina's assistant manager of manufacture, Richmond, and who was elected chairman for the next 12 months, took over for him. O. A. Dixon, Southern production supervisor for International Minerals and Chemical, was elected vice-chairman.

In the following pages you will find reproduced several of the talks and some case histories which developed out of that meeting. And you will remember that last month we published the outline of the Fertilizer Safety Section's history which Vernon Gornto, Smith-Douglass, presented on Monday afternoon's session.

This was followed by the Conveyor Safety talk by R. S. Diserens, which follows on this page, and in turn was followed by the Mining Hazards paper of B. J. Phillips, which begins on page 41 of this issue.

The next morning the fertilizer folks joined the main body of the conference, to attend the general session. So it was afternoon before they got back to their own special subject.

W. C. Creel, able safety director of the North Carolina department of labor, presented safety facts and figures which show how safety programs can make the savings which are the goal of all our safety men.

Curtis Cox presided over a panel which occupied the remainder of the afternoon and presented W. A. Stone, Wilson & Toomer, whose case history follows on page 40;

Frank Kruck, Virginia-Carolina, whose case history is on page 76; O. A. Dixon, whose case history was discussed in executive session because of its unusual nature. Roy W. White, Lion Oil supervisor of safety, personnel and plant protection, was unable to attend.

It was agreed that better timing of the fertilizer section meetings is important, in order to hold them at a time when more members can be spared from their work. The 1955 Southern Safety Conference meeting will be in New Orleans, February 27-28, and the 1956 meeting will be in Atlanta, March 4-6. The Fertilizer Section of the National Safety Council will meet at the LaSalle Hotel, Chicago, October 18-19 this year.

CONVEYOR SAFETY TIPS

By R. G. DISERENS, Safety Director, Phillips Chemical

Conveying systems date back several hundred years. Our ancestors were ingenious enough to use the law of gravity and logs as conveying systems. They also found that water could be used as conveyors. For hundreds of years the Chinese have used and still use bucket conveyors for lifting water from streams using men walking on treadmills for power. As civilization has advanced, the need of devices for moving materials has increased to such an extent that conveying systems are a necessity in almost all phases of industry. Unfortunately the frequency of accidents in handling materials has also increased to the degree that materials handling is considered very hazardous. Industry has learned to manufacture highly toxic, highly explosive, highly inflammable and all kinds of dangerous materials with safety. Why is it then we have such a high frequency handling the materials after they have been manufactured?

For example, we have manufactured nitric acid for several years without a serious injury, but have had several serious injuries handling materials. Since most conveying

systems are of a rather simple construction and travel relatively slow we probably do not do as much preventive maintenance as we do on operating equipment. We should remember that the conveying equipment is a definite part of our operations and deserves some attention both from a safety and maintenance



KEY TO PICTURES

1. Stewart Washburn, Senior Engineer, National Safety Council, Chicago, and W. C. Creel, Safety Director, North Carolina Dept. of Labor, Raleigh, discuss plant safety posters. 2. R. G. Diserens, safety Director, Phillips Chemical Co., Bartlesville, Vernon Gornto, Safety Director, Smith-Douglass Co., Inc., Norfolk, and B. J. Phillips, Safety Director, Coronet Phosphate Co., Plant City, Fla. 3. O. A. Dixon, Southern Production Supervisor, International Minerals & Chemical Corp., East Point, Ga., and C. A. Cox, Asst. Mgr., Manufacturing Dept., Virginia-Carolina Chem. Corp., Richmond, who will serve as co-chairman of the Southern Fertilizer Safety Section for the beginning term. 4. Frank Kruck, Safety Inspector, Virginia-Carolina Chem. Corp., Richmond, W. A. Stone, Supt., Wilson and Toomer Fert. Co., Jacksonville, Fla. 5. Albert A. Waugh, Safety Supervisor, Bartow, Fla. 6. O. A. Dixon, Southern Production Supervisor, East Point, Ga., and H. E. Moley, Chemical Engineer, Spartanburg, S. C., all of International Minerals & Chemical Corp. 7. E. S. Brannock, Plant Engineer, Davison Chemical Corp., Nashville, Tenn. 8. Edgar S. Barry, Supt., Louisville, H. C. Hodge, Asst. Supt., Louisville, C. A. Cox, Asst. Mgr., Manufacturing Dept., Richmond, all of Virginia-Carolina Chemical Corp. 9. R. E. Spicer, Asst. Supt., Virginia-Carolina Chemical Corp., Montgomery, Ala. 10. C. J. Wilson, Chief Plant Protection & Safety, Spencer Chemical Co., Henderson, Ky.

Presented at the Fertilizer Section of the Southern Safety Conference Louisville, Kentucky March 8, 1954

COMMERCIAL FERTILIZER

**CF AT THE
SAFETY
SECTION
SESSION
IN
LOUISVILLE**



standpoint. Improperly maintained and makeshift types of conveyors contribute to the frequency of accidents. The people that design these makeshift conveyors have but one purpose in mind and that is to convey materials. Little thought is given to making them safe to operate.

We have several different types of conveyors of which a few are: belt, screw, bucket, chain, blower, trolleys and monorails not to mention several others. Let us dwell on the types that are most common in our industry starting with belt conveyors.

First we should know the type of accidents that occur when using this type of conveyor. Some of the most common causes are: the employee gets his hand caught between the belt and the pulley; the employee gets his hand caught in the drive "V" belts or drive chain; while making adjustments on equipment while it is in motion; riding on conveyors, oiling, climbing over, unplugging jams and starting equipment when other employees are working on the equipment. These are but a few of the common causes of accidents on belt conveyors. In order to reduce the frequency of these accidents we need to apply a few basic practices and regulations. When new conveying equipment is to be installed the safety people should work with the design section, thus eliminating some of the obvious hazards such as proper guards for gears, belts, etc.; location of masterswitches; walkways along side of conveyors (should they be needed); electrical interlock and emergency shutdown switches.

Let us elaborate on these items a bit. I believe everyone is familiar with proper guarding of gears, belts, pinchpoints, etc. These guards should be made of good heavy materials. So often we find that the guard has been made of light materials and becomes so bent and distorted that when once removed they will not fit again. Masterswitches should be located so as to be accessible for locking out procedures. On long permanent conveying systems, walkways with guard rails and toeboards should be installed so that equipment can be repaired, oiled, checked,

etc. thus minimizing personnel exposure. Where you have two or more independently driven sections of conveying equipment they should be interlocked so that when one section is shutdown all sections preceding will be automatically shutdown, thus eliminating pile-up of materials. It is my personal opinion that interlocked conveying systems should **not** have one control push button panel that will permit starting of all sections from one point. I know of several severe accidents that have occurred because of this.

A maintenance man is working on a section of equipment and the operator is told or assumes, without checking, that the maintenance man has finished. He then pushes the button starting the equipment and the results are that the maintenance man is caught in the machinery. In order to prevent this the starting switch can be located so that the operator will be forced to go to each section and therefore he can see that everyone is in the clear before starting the equipment.

The emergency shutdown switches should be located at the end of each section or in the vicinity of the tail drums or pulleys and any other place that they are deemed necessary.

Now that we have discussed some of the hazards that can be eliminated in the design stages let us discuss other possible means of eliminating accidents.

When repairs are to be made there should be some method of being sure the equipment is not started until the repairs have been completed. The two methods most widely used on electrically driven equipment are the lockout and tagging procedures. When using the lockout method the masterswitch is pulled and locked out with the foreman in charge of repair, or the maintenance man doing the work in possession of the key. When the repairs have been completed the foreman or maintenance man then removes the lock thus turning over the equipment to operation.

When using the tagging system, signed tags are used in place of padlocks. When more than one craft such as welders, mechanics and electricians are working, multiple locks or tags are used. Each craft must respect the other craft's lock or tag in order to make these methods successful. I might add that when doing extensive repairs some plants disconnect the electric wires from the motor.

Whistles and horns are sometimes used to signal the starting of equipment. However, due to their loud noise men often make these devices inoperative by attempting to mute them.

In order to reduce the hazards of oiling conveying equipment pressure systems with extension pipes are used. These extensions make it possible for the oiler to reach out-of-

ACCIDENT WITH TRACTOR SHOVEL

By W. A. STONE, Supt., Wilson & Toomer

We were hauling material from a bin past a mixer that had been pulled out for repairs. Although the operator had plenty of room he drove close to the mixer and was holding his hand on the top of the hydraulic piston on the left side next to mixer. He jammed the top of the hydraulic piston against bottom of the operator's wheel on the mixer and caught the tip of the middle finger, losing one joint of the middle finger.

This point is one that a guard would not be practical. We have been stressing safe driving both from driver safety and other employees.

the-way places that are not otherwise accessible with a minimum of exposure.

Rigid rules should be made and enforced that employees are not permitted to ride on conveyors.

Accumulation of materials on the drums or tail pulley should not be removed while equipment is running. To prevent employees from attempting this some plants extend heavy mesh guards out from pulleys several feet.

Crossovers or walkways should be installed to prevent employees from climbing over conveyors.

Several of the hazards found when operating belt conveyors are also present when operating screw conveyors. Quite often we find that the screw conveyor is driven with a chain or sprocket. These chains and sprockets should certainly be properly guarded. One of the most hazardous situations arises when some employee removes a section of the conveyor covering to work on a hanger and fails to place the cover back in place. The results are that some employee steps into the conveyor and is seriously injured. These injuries can be prevented providing there is a rigid rule that the equipment is not to be started until all covers and guards are in place.

Bucket conveyors are usually enclosed; however, keeping the inspection doors in place presents quite a problem. Keeping the inspection doors in place can best be done by making frequent inspections. The gears and drive should be guarded the same as on other types of conveyors.

Time does not permit us to discuss other types of conveyors. Some of them are a subject in their own right.

We can summarize by saying that conveying systems in the majority of our plants are neglected. In other words, not enough safety and preventive maintenance as well as not enough thought given to design. With a little more effort on the part of all of us I feel sure the accident frequency on conveying systems can be reduced.

HAZARDS OF PHOSPHATE MINING

The address of B. J. Phillips, safety engineer, Coronet Phosphate Company, Plant City, Florida, a division of Smith-Douglass Company, Inc. at the fifteenth annual Southern Safety Conference, Louisville, Kentucky, March 8.

The general opinions of the Phosphate Mining Industry differ considerably from those of the Fertilizer and Chemical Industries. We have many and varied hazards.

First, let's consider the different types of hazards which are encountered in all industries, regardless of their nature. There are Physical, Personal, Inherent and Created hazards. Now the question is, which of these is the most important? We are told that 78% of all accidents are due to **people**, while only 20% are due to **conditions**. The remaining 2% are charged to acts of God.

Since I have mentioned **physical** hazards first, let's look at the Phosphate Industry and start at the mine and follow the processing step by step through the plant. First of all, the area which is to be mined must be cleared and drained, the hazard here being the use of heavy equipment. The next step is to build high voltage power lines into the area to operate the large electric draglines and pumps, which mine and pump the phosphate matrix to the washing plant. These power lines must be moved frequently in order to keep up with the operations. There are large power cables which run from pole switches to the draglines and pumps. These cables in some cases measure in length up to 1000 feet, and lie on the ground. Men must pull the cables along with the machines, using "hot sticks." This is a potential hazard.

After the area is ready for mining, large draglines remove the overburden, which in some cases will measure 50 to 60 feet in length. In such instances, it is necessary to have pumps installed on barges in the bottom of the pits to keep the water pumped out so as not to hamper mining operations. The hazard here is the possibility of caveins and slides coming into the pit and upsetting the barge. The men must

wear life jackets at all times in such areas.

The large pipe lines carrying the phosphate to the washing and flotation plants, which may be several miles away, certainly present a hazard. They must be moved frequently, just as the power lines, in order to keep up with the mining operations. The pipe is handled largely by mechanized equipment, but all fitting and coupling must be done manually.

When the rock reaches the washing plant, where it is washed and screened, we encounter the usual hazards of most plants—open gears, unguarded belts, housekeeping, etc. After the rock is washed and screened, the fine material then goes to the flotation plant where the phosphate is floated from the sand. Here again we are confronted with the usual plant hazards, but in this process we are also faced with an acid problem. Now perhaps you are wondering just how acids get into this picture. In the flotation plant the following reagents are used to float the phosphate rock: sulphuric acid, amines, caustic, fatty acid, kerosene and fuel oil. I am sure all of you will realize the hazards encountered when handling these reagents.

After the washing and flotation processes, the phosphate is conveyed to large storage piles, which in some cases are 1000 feet in length, where it is stored according to the grade of the rock. Under these storage piles are tunnels, into which the rock is pulled by chutes, then conveyed by belts to the drying and grinding plants. As you can see from this, there are thousands of feet of conveyor belts, which are certainly hazardous.

This outline of the process of mining phosphate is by no means complete. In fact, I have hardly scratched the surface. However, since my time is rather limited, I wanted to give you this brief resume, then spend most of my time discussing the greatest hazard of all with which we have to contend—People—Human

(Continued on page 74)



Following tour of American Potash & Chemical Corporation plant at Trona, Calif., (see story below) company representatives and visitors gathered at guest quarters for informal discussion. Shown here are, left to right: Lew West, Wilson & George

Meyer & Co.; J. F. Smith, Dow Chemical Co.; William Floyd, Shell Oil Co.; Robert B. Coons, AP&CC; J. F. Smith, Dow Chemical Co.; A. J. Anderson, AP&CC; Peter Colefax, AP&CC and Jeff Meyer, Wilson and George Meyer & Co.

ARKANSAS

Hughes Liquid Fertilizer Co. with plant at Bledsoe and offices at Hughes is now completely under the management of **Clarke Kinney**, who promises "twenty four hours a day" anhydrous ammonia service to his trading area, with technical assistance, soil sampling, farm planning and custom application by cooperating operators.

* * *

Mid-Ark Land Fertilizer Company has been established near Lonoke by **W. H. Bransford, Jr.** for the distribution of anhydrous ammonia.

CALIFORNIA

Karl Ahlswede, as we mentioned here last month, got tangled in terminology and called his proposed plant near the U of Cal campus a "fertilizer factory." His attorney said it would be better described as a "chemical blending plant." But pressure was so great from the Citizens University Committee and the University Improvement Association, university officials and owners of

property in the university zoning district that Karl withdrew his application. The basis of the protest, according to advices from Riverside, was not that they did not trust Karl fully, not that his plant would be objectionable in itself—but that if they let him come in, they could hardly say no to others who might be objectionable.

* * *

The **U of Cal**, on the other hand, four days later announced the erection of a \$25,000 insecticide compounding building on the Riverside campus.

* * *

American Potash & Chemical recently entertained more than 40 chemical industry leaders at their Trona plant (see pictures)—a one day flying visit which in 12 hours brought the group from San Francisco in a chartered plane, took them through the plant and community, lunched them—and sent them back again to San Francisco.

J. F. Phillips, associate research director talked on the geology of the

lake. President **Peter Colefax** welcomed them. Plant technical director **G. T. Deck** explained the process used at Trona.

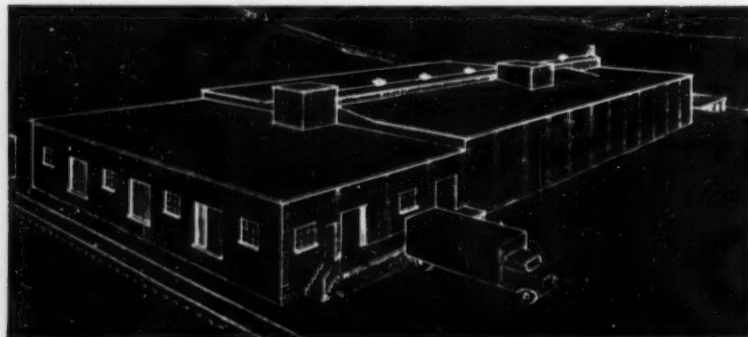
Other American Potash & Chemical officials and sales staff present were **W. J. Murphy**, vice president, sales; **Robert B. Coons**, vice president, industrial relations; **P. S. Dunn**, vice president, production; **A. J. Anderson**, Trona plant manager; **W. J. F. Francis**, general sales manager, western; **F. E. Branch**, assistant Trona manager; **W. M. Clines**, sales manager, heavy chemicals, western; **R. N. Hoh**, sales supervisor, soda ash & salt cake, western; **Rod Taft**, sales supervisor, potash, western, and **D. A. Lundy**, sales supervisor, borax, western.

Among the guests were **Wilson Meyer**, president, **Jeff Meyer** and **Lew West**, executive vice president, all of **Wilson & Geo. Meyer & Co.**; **Bob Sholaas**, owner of **San Jose Chemical Co.**; **L. W. Hileman**, purchasing agent, **Herb Stanley**, purchasing agent, and **William Floyd**, director of purchases, **Shell Oil Co.**; **Herb Daley**, purchasing agent, and **J. F. Smith**, sales department, **Dow Chemical Co.**; **Stan Carlson**, purchasing, **Standard Oil Co.** of California; and **Guy Frederick**, purchasing agent of **Monsanto Chemical Co.**

Also present were **K. S. Hawkins**, chemist, **Diamond Alkali Co.** of California; **George R. Monkhouse**, vice president, **Shell Chemical Co.**; **Roy Meiklejohn**, in charge of production for **General Chemical Co.**

COMMERCIAL FERTILIZER

Below is the architectural perspective of Wm. B. Tilghman Company's proposed new fertilizer plant, to be constructed at Pocomoke City, Md. Its operation, with automatic electric equipment, will be modern in appearance and detail.





Around the Map

FLORIDA

F.E.C. Fertilizer. Homestead, were saved from an attempted burglary when a company official happened to come in late of a recent Saturday afternoon and caught the thief in the act. He escaped, but empty-handed.

GEORGIA

McClellan Laboratories, Elizabeth, lost their plant in a \$50,000 fire. Evidence pointed to the fact that someone had broken into the building before the fire started. They are producers of insecticides and disinfectants for poultry breeders. **Claude Pate** is sales manager.

The **C. O. Smith Guano Company** plant of Douglas, reported on here most recently in January, is in operation though construction is not entirely completed, turning out a ton every two minutes on highly mechanized equipment.

IDAHO

Monsanto Chemical's plant at Soda Springs is going along well, and should by Fall be turning out phosphate which, however, is largely destined for other than fertilizer purposes. The operation is listed only as "a multi-million dollar investment." It will double facilities there which are now processing daily 750 tons of rock.

ILLINOIS

Illinois Farm Supply Company has formally announced the plant near Tuscola which was foreshadowed in our issue of January, which told of their purchase of a 20-acre tract for this purpose. **Fred E. Herdon,** presi-

dent, announced March 9 that the Board had authorized construction of a new fertilizer plant which will cost in the neighborhood of \$1,000,000, and that construction should begin by May or June. Contract for construction had not yet been let.

When complete, the new plant will employ some 25 people, and turn out 50,000 annual tons of high-analysis, granular mixed fertilizers. It will have 8,000 tons of bulk storage capacity.

I.F.S., which is an affiliate of **Illinois Agricultural Association,** owns a plant of 65,000 annual ton capacity at East St. Louis, which went into operations on their "Gro-Flo" plant foods in 1949, and a part interest in a cooperative at Hartsdale, Indiana.

IOWA

Henry County Supply Cooperative, Mt. Pleasant, has purchased a building which is to be extensively remodelled and used as a bulk fertilizer blending plant. The main building is 90 by 120 feet, with a smaller portion of 50 by 50 feet. A spur track is to be laid. **Harold Knedler** is manager of the co-op.

H. H. Sheka, long-time Grafton fertilizer dealer, has entered the liquid nitrogen field there, with 28,000 gallon storage and four applicators—two for customer work, two for rental.

KANSAS

Snyder Chemical, working in conjunction with the **Louisburg Elevator Co.,** recently conducted a fertilizer school at Louisburg, with **Preston O. Hale** as the principal speaker.

Colored motion pictures were shown, refreshments served.

Soil Aid Corporation, Coffeyville, announce they have developed a new process which produces an organic soil builder. This is described by president **O. K. Hamlin** as the result of collaboration between **Herb Wilson,** technician at Coffeyville Memorial Hospital, and **Dr. Erich Sarapu,** of **Sinclair Coal Co.**

"The ingredients include finely ground coal. They are heated to 1,000 degrees and superimposed on the coal to allow it to sweat. This helps to reduce bacteria" says Mr. Hamlin. "This material will leave the soil in as good condition after the crop is harvested as it was before planting."

The concern is in its second year of business. Reorganized in April, it has as officers, in addition to Mr. Hamlin: **Lloyd Ford,** vice president; **Richard Digby,** secretary-treasurer; **Edgar Schoke,** assistant secretary. The latter two were among the original founders. Mr. Digby is in charge of production.

Farmers Nitrate Association has been incorporated at Oswego, with a capitalization of \$70,000. **Walter L. Taylor** is resident agent.

LOUISIANA

Lake Charles Harbor and Terminal District board of commissioners recently opened bids for the construction of a \$1,100,000 phosphate rock grinding plant, which will be distributed throughout southwest Louisiana by truck. **Harry G. Chalkley** is president of the board. Construction is scheduled for early Fall completion.

Madison Fertilizer, Inc., Tallulah, has been chartered with capital stock listed at \$50,000.

MINNESOTA

Minnesota Liquid Fertilizer, Minneapolis, now in its second year of operation, is planning additional bulk plants at Kenyon, Blooming Prairie, Kasson and Madison, bringing their total to 21. The new plants will each have a 30,000 gallon storage tank.

These new facilities will permit them to double the area now served. The concern is headed by **B. W. Smith**, with **Frank Emrick** as vice-president and general manager.

MISSISSIPPI

Rankin County Anhydrous Fertilizer Distributing Company, listing capital stock of \$25,000, has been granted a charter of incorporation. Headquarters are at Brandon.

Edwards Fertilizer Company, Hinds County, has been chartered with \$15,000 listed capital stock.

NEBRASKA

Farm Fertilizers, Inc., Omaha, have retained **D. M. Weatherly Company**, engineers and builders, Avondale Estates, Georgia, in connection with an improvement and expansion program announced by **R. E. Bennett**, president. Farm Fertilizers was one of the pioneer producers of granulated mixed fertilizers in the mid-West, beginning in 1949, and have only recently completed a sizable addition to their Omaha plant.

The new facilities will include the TVA continuous ammoniation process, and should be completed this Summer.

Summers Fertilizer's new plant at Sioux Falls, South Dakota, in operation since mid-January. Capacity 40,000 annual tons of complete fertilizer. The main factory building is 100 ft. wide, 300 ft. long, and 46 ft. high. Bulk Materials received by car are unloaded by payloaders, fed to an elevator delivering to a conveyor belt installation for distribution to the proper storage bins. Machinery by Stedman Foundry & Machine Co., designed around a two-ton mixer producing a semi-granular product. Power shovels, conveyors and air-actuated equipment keep operating costs minimum. A St. Regis 327 valve packer delivers bagged fertilizer to a conveyor leading to the shipping platform. **W. A. Stolt**, Summers' manager at Grand Forks since 1948, is now General Manager of both Dakota plants. **A. J. Klaverkamp**, assistant manager. **Wm. H. Rasmussen**, has been named Manager of the Grand Forks branch, with **Kenneth Stamus**, Agronomist, and **Arne Askjem** as general assistant.



NEW YORK

Virginia-Carolina have signed a long-term lease at 99 Park Avenue, New York City, a new building under construction. They hope to move in early Spring from their present branch quarters at 500 Fifth Avenue.

Henry J. Blackstone, Inc., fertilizers, etc, c/o Robert I. Blackman, has been granted charter of incorporation listing capital stock of 100 shares no par value. Directors: **Lenore Kraft**, **Goldy Boss** and **Robert I. Blackman**, all of 67 West 44th street, New York City 36, N. Y.

NORTH CAROLINA

Standard Fertilizer, after long negotiations, have secured a site for their Mount Olive anhydrous ammonia operation, and will develop there a \$70,000 installation. **Jack Loftin** and **James G. Dickson** are the principals. They have already conducted a school for local farmers on the use and application of anhydrous ammonia.

OHIO

American Agricultural Chemical Co. has formally opened its new plant near Cairo. It will produce some 60,000 annual tons of Agrico and AA brands of fertilizer and 18%

superphosphate. **J. C. Sliger** is manager; **D. C. Rapalje** is plant superintendent.

Diamond Fertilizer, Sandusky, has leased with option to buy the plant of **Buckeye Sugar Co.**, Ottawa, and will operate it as **Diamond-Ottawa Agricultural Chemical Co.**, according to **Howard Morgan**, vice-president and secretary. Fertilizer products of both concerns will be handled by and from the new organization.

In June or July a \$150,000 expansion program will get underway to increase the Ottawa facilities from 12,000 annual tons to 25,000.

The Buckeye concern has been sold for \$287,500 by its president, **David M. Keiser**, to a group of Ottawa investors, who have concluded the lease with Diamond.

OKLAHOMA

Nichols Seed Co., Jones, who purchased the insecticide manufacturing facilities of **Agricultural Chemical** in Oklahoma City, as we reported here in February, and has moved it to Jones. The equipment has a daily capacity of 20 tons of dust and 100 barrels of liquid pesticide.

Phillips Petroleum, Bartlesville, when they sent out March 1 dividend checks, included an attractive little folder outlining the progress of **Phillips Chemical** in the plant food field. Mention was made of the Adams Terminal facilities and the Cactus Ammonia and Nitric plants, with some basic information about how the use of fertilizer has helped US farmers feed more people on fewer acres.

PENNSYLVANIA

G.L.F. has opened a new fertilizer plant at Union City, which is equipped with the latest mixing machinery.

SOUTH CAROLINA

Victor Fertilizer has purchased the buildings and equipment formerly operated by **Southern Cotton Oil** in Chester and will operate as **Oliphant and Company**. **R. A. Oliphant** is owner of both concerns.

COMMERCIAL FERTILIZER

TENNESSEE

Monsanto's purchase of 300 acres near Franklin, for \$135,000 is reported as a routine purchase of phosphate lands for future mining.

TEXAS

United Chemicals, Dallas, are to build an \$18,000,000 plant at Timpson, with Foster-Wheeler in charge of construction. The plant will produce urea and anhydrous ammonia, using the Pechinery and Casale synthesis processes. The community has voted to build a 1500 acre lake. Grover Hartt, president, says the project will be privately financed.

Rowland and Gordon Farm Chemical and Fertilizer, will shortly complete their new establishment in Petersburg, with W. C. David in charge as manager.

City Fertilizer, Houston, startled the neighbors for 10 miles around with a blast which centered around their fertilizer ducts, but did minor damage.

VIRGINIA

St Regis Paper has selected 21 acres at Franklin, on which a new multiwall bag plant will be built, which will be occupied under a long term lease. It will replace the plant now leased from Camp Manufacturing who require it for their own expanded operations.

The new facilities will provide 160,000 square feet, and will be constructed in the near future.

Shelton-Gregory Lime and Fertilizer, Chatham, are building a new plant in Halifax. Principals are Stone Gregory, Otis Shelton and Judge Carlton White.

Smith-Douglass were recently robbed of three cases of dynamite from the Danville plant—enough to wreck a city block. Entry was gained by forcing a lock.

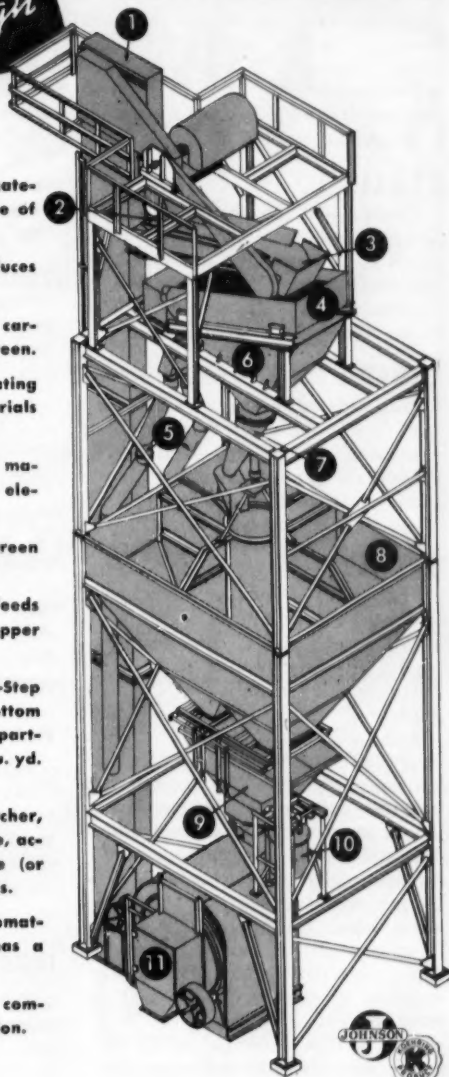
WASHINGTON

Charles H. Lilly Co. held an open house recently at their new fertilizer

JOHNSON BLENDING PLANT

take a 1-minute "tour" through

1. Chain bucket elevator feeds material into the plant at the rate of 1000 cu. ft. per hour.
2. High-speed clod breaker reduces materials to required size.
3. Self-cleaning belt conveyor carries pulverized material to screen.
4. Vibrating, 4x10-foot separating screen controls size of materials fed into collecting hopper.
5. Reject pipes return oversize material from screen to bucket elevator for re-sizing.
6. Collecting hopper under screen charges pivoted distributor.
7. Full-revolving distributor feeds screened material from hopper into sectional storage bin.
8. Johnson 65 cu. yd. Step-by-Step Bin, with fast-flowing 60° bottom slopes, has four 15-yd. compartments arranged around a 5 cu. yd. central tank.
9. Multiple-material weigh batcher, with 5,000-lb. dial-head scale, accurately weighs up to five (or more) fine-grained materials.
10. For adding liquids, semi-automatic solution weigh-batcher has a capacity of 500 lbs.
11. Mixing unit (2-ton capacity) completes final blending operation.



Eliminating slow, costly manual methods, Johnson fertilizer plants elevate, pulverize, screen, batch, and blend materials in one continuous cycle of operation. Owners report substantial increases in production and savings in manpower. Installation shown here is one of two Johnson plants developed to meet the

special needs of a large midwestern fertilizer manufacturer. It is typical of the many sizes and types of Johnson plants available for mixing and blending all types of materials . . . manually-operated or fully automatic. You can get many profitable ideas on plants and accessories from Johnson distributor . . . or write us.

J349

Mail to: C. S. JOHNSON CO. CHAMPAIGN, ILL.
(Kochring Subsidiary)

☐ Send us more data on Johnson fertilizer blending plants. ☐ Have Johnson distributor call.

NAME _____ TITLE _____

COMPANY _____ DIV. _____

STREET _____ CITY _____ STATE _____

CITY _____ STATE _____

Also interested in: ☐ bulk phosphate storage plants ☐ aeration systems ☐ screw conveyors
☐ bucket elevators ☐ bins ☐ hoppers ☐ batchers ☐ clamshell buckets

April, 1954

plant and wholesale branch at Mount Vernon. Visitors were shown the plant; movies were run for them; refreshments were served. When in full operation, the plant will turn out 8,000 annual tons.

BRAZIL

Cubateo Oil, Santos, expect their new nitrogenous fertilizer plant to be in production this month. Their equipment came from the US and Europe, and is the first of its kind to come into production in Brazil.

CANADA

Consolidated Mining and Smelting have now culminated a program of expansion costing more than \$17,000,000 which has increased their capacity more than 150,000 annual tons. Their 1954 output will total 700,000 tons of high analysis fertilizer materials.

They have announced that work will commence immediately on a major expansion of the ammonia production facilities at its Alberta Nitrogen Department at Calgary, Alberta.

This is part of Cominco's long range chemical and fertilizer expansion program. The project will provide sufficient additional ammonia to allow full-cut operation of Cominco's large ammonium nitrate fertilizer facilities at Calgary, Alberta and Trail, B. C., and will also allow sales of substantial quantities of anhydrous ammonia to meet the rapidly growing demand for this material in the industrial and agricultural markets of the west. On completion of this project, Cominco estimates that its fertilizer output will be increased by more than 50,000 tons annually.

"For several years," a Company officials states, "Cominco has been conducting extensive market and process research in order that the Company will be in a position to meet the growth and changes that are occurring in the markets it serves. As part of this program, **J. V. Rogers**, manager of the engineering division, and **R. S. Woodford**, general superintendent at Calgary, are presently inspecting urea and other fertilizer and chemical plants in the United States, Europe and Japan."

Cominco's \$9,000,000 ammonium phosphate plant at Kimberley, British Columbia was reported in production in our January issue. In addition to this they have expanded and modernized fertilizer plants at Trail, B.C., and Calgary, Alberta. As the result of increased efficiency and capacity they have moved into position to serve, in addition to Canadian markets, certain Western US areas. To these their shipments have increased from the 200,000 tons shipped into the US in 1947 to 450,000 tons in 1953.

* * *

Rohm & Haas Ltd. have under way the construction of a plant near Toronto, which will serve the fertilizer and other industries.

CHILE

Sali Hochschild Mining have a permit to import, duty free, necessary equipment for a daily 20-metric-ton sulphuric acid plant at Copiapo. Bids are to be invited from American firms.

INDIA

Sindri Fertilizer Factory is now operating at 750-800 daily tons. The Ministry of Production is taking steps to bring up operational efficiency so as to produce the 1000 daily tons of ammonium sulphate of which the plant is capable.

IRAQ

Texas Gulf Sulphur, which we reported here in February as working with the Iraq government on a 50/50 sulphur development 50-year program reports that exploration indicates enough sulphur in the area to bring the government's yearly income to a par with its present oil royalties, about \$150,000,000 a year. Hence they have agreed to build a railroad from the mines to connect with the Iraq State Railways, to connect Northern Iraq with Syria and Lebanon and thus the Mediterranean coast.

MEXICO

Texas International Sulphur expect their new sulphur processing

plant at San Felipe to be completed this month. It will initially produce at the rate of 700 monthly tons, using the autoclave method to process sulphur from shallow ore deposits which exist for several miles in the San Felipe area. Capacity can readily be doubled, when market conditions warrant, according to **Victor Dykes**, president.

* * *

Stauffer Chemical Company announces the addition of a second insecticide dust manufacturing plant by its Mexican subsidiary, **Stauffer de Mexico, S. A.**

The new plant is located at Rio Bravo, Tamaulipas, in the heart of the rich Matamoros-Reynosa cotton producing area.

For more than a year, Stauffer de Mexico, S. A. has been operating an insecticide plant at Nogales, Sonora, in order to serve Western Mexico with agricultural pesticides. With the opening of their new plant at Rio Bravo, the Stauffer organization is expanding its efforts to more adequately provide Mexican agriculture with top quality pesticide materials.

As a further aid to the growers of Eastern Mexico, technical service is being carried on by a staff of trained entomologists under the direction of **Carlos M. Gonzalez**, a recent graduate in Entomology from Texas A & M College.

Sales of materials for Eastern Mexico from the Rio Bravo plant will be under the supervision of **Roy S. David**, territorial sales manager, who is residing at Monterrey, N. L.

Stover Joins Oklahoma F & C

George H. Stover is now treasurer-business manager of the **Oklahoma Fertilizer and Chemical Company** effective as of February 15, 1954. Mr. Stover replacing **Norman G. Jones**, who has resigned.

Mr. Stover comes to OF & C from **Modern Steel Building, Inc.**, of Oklahoma City, Oklahoma. **Otto Clayton** has been elevated to the position of purchasing agent. **John Souter**, vice-president-operations, will continue to direct production. **Arnold E. Neumann** is sales manager.

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(ALKYL ARYL SULFONATE)

Modern fertilizer manufacturers use this efficient and economical form of surface active agent for faster curing and reduction of blocking in the pile and in the bag.

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ULTRA CHEMICAL WORKS, INC.

PATERSON, N. J.

*T.M. Reg. U.S. Pat. Off.

CARTER HEADS CANADIAN PESTICIDE ASSOCIATION

The first annual meeting of the new Canadian Agricultural Chemical Association in Toronto brought out 200 representatives of the industry in Canada. A number of speakers discussed the status of the industry and technical aspects of the field of pesticides, including H. E. Wood of the Manitoba Department of Agriculture and Dr. A. W. A. Henry, University of Alberta. Both of these stressed the fact that the surface is barely scratched in the Canadian market for pesticides.

In existence less than a year, the purpose of the CACA is to promote and advance in a manner consistent with public interest the progress and development of those industries manufacturing and distributing agricultural chemicals of all kinds. It hopes as well to promote and foster research on an industry-wide basis into a number of common problems. The new association plans to co-operate with federal, provincial and other agencies in matters pertaining

to the industry and to study and inform members concerning existing and proposed legislation affecting them.

Guest speakers were W. Murdoch, president of Ford Tractor & Equipment Sales Co. of Canada, who addressed the luncheon and Dr. K. W. Neatby, Canadian Department of Agriculture, who spoke at the evening banquet.

Arthur H. Carter, general manager Green Cross Products, Sherwin-Williams Co. of Canada, Montreal, was elected president of the association. Other officers elected were: M. F. Anderson, Naugatuck Chemical Co., 1st vice president; W. R. Geddes, North American Cyanamid Co., 2nd vice president; R. G. Smith, Charles A. Smith Ltd., secretary; K. B. Owens, Monsanto (Canada) Ltd., treasurer. Directors: R. M. Ferguson, Dow Chemical of Canada, G. E. Willan, Niagara Brand Spray Co., J. H. D. Ross, Canadian Industries Ltd.

Cotton Men To Talk Pest Problems

Cotton leaders throughout the Far West will gather in Phoenix, Ariz. on April 13-14 to plot battle against crop-damaging insects in this part of the Cotton Belt. E. S. McSweeney, executive director of the Arizona Cotton Growers Association has announced.

Organic Folly Reprints Offered Free To Industry

Progressive Farmer has a supply of reprints of an article by Eugene Butler — "This Organic Farming Folly" which they will be glad to supply without charge in lots up to 100 copies on a "first come first served" basis while they last. This paper is an answer—thorough and conclusive—to the questions which now and then plagues our industry: "Do chemical fertilizers destroy soils and damage health? Is there anything at all to all this organic farming talk?" For your copies, write The Progressive Farmer, Birmingham 2, Alabama—attention Frank S. Green, Merchandising Manager.

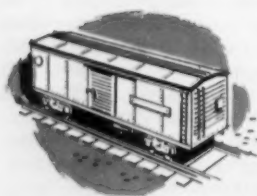
STOP BAG SLIPPING WITH...

Hudson's New



Unique "Bowling" trials show slip-resistance of Hudson Inks . . . Hefty two-hundred pounder slides equal weight multi-wall sacks down alleys with full force. Bag in left foreground with Hudson's new NON-SLIP INK stops in 20-ft.

Ordinary sack (right) skids full length of alley for a strike. Here's proof-positive of NON-SLIP INK'S gripping power.



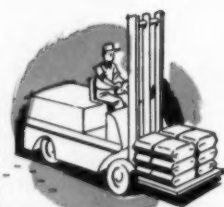
We humped a freight with half a carload . . . not a single Hudson Non-Slip Ink sack slid or broke!



Do you ship by truck? Buy Hudson Bags with Non-Slip Ink and watch your "Slip-break" losses shrink!



Non-Slip Ink puts an end to sacks sliding under their own weight and falling apart like a house of cards!



Sudden stops no longer mean sudden losses from bags that slip, slide and break!

Non-Slip Ink!

...at no extra cost!

Takes Skid Out of Your Bags!

Again Hudson puts your shipping problems "in the bag" for you ... with this exclusive, specially developed NON-SLIP ink.

What's more, there's NO EXTRA charge for this ink! Stack this up with all the other superior features of Hudson multi-wall sacks and you know you're buying the best bags money can buy when you make the order out to *Hudson!*

Here's Why:

Best Protection — cuts package loss caused by slipping — Takes rough handling in transit! Hudson strongest by far!

Less Re-Handling — because slipping in packing and storage is virtually eliminated — No double handling.

Free Moving — designed for perfect handling on chutes and conveyors.

Labor Savings — easier and faster to handle — No fumbling with Hudson's "Sure-Grip Multiwalls."

Send for complete story today!



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NON-SLIP INK.

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NEW TYPE STURTEVANT AIR SEPARATOR

*Recovers
Fines
in Micron
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Now the famous Sturtevant Whirlwind Air Separator, so widely used throughout industry for fast recovery of fines, has been specially designed to "pick-off" classified materials such as pigments, limestone fillers, plastics, oyster shells, etc., in micron sizes.

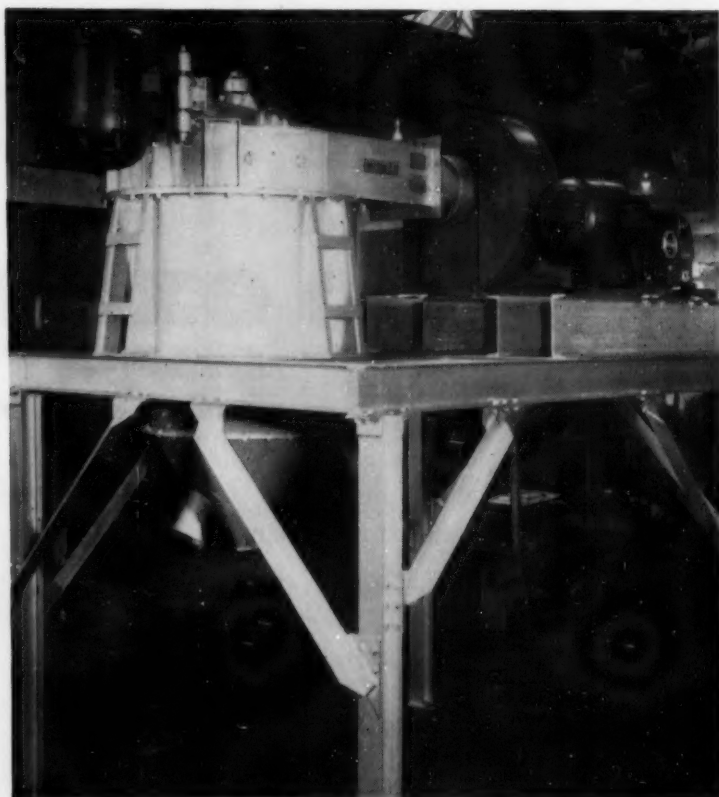
These highly efficient air separators select a continuously uniform product of desired fineness. Used in a closed circuit with grinding mills, they increase production, cut power costs.

Large feed opening, rugged construction, ease of adjustment, low power consumption assure economy of operation and minimum upkeep. Write for further information.

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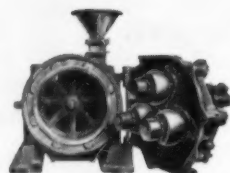
OTHER STURTEVANT EQUIPMENT



MICRONIZER® GRINDING MACHINE

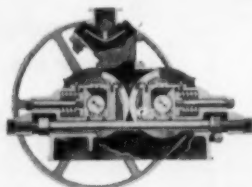
A fluid jet grinding machine, the Sturtevant Micronizer speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

Sturtevant Micronizer grinding machines are available in many sizes and capacities.



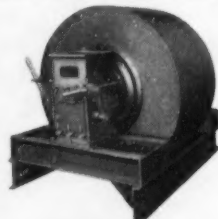
RING-ROLL MILLS

For medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operate in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS

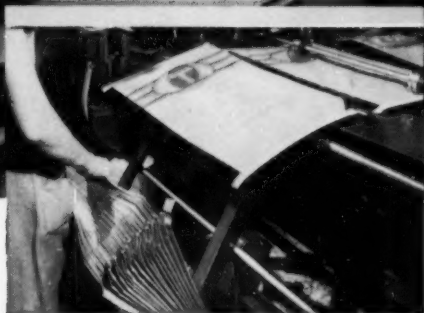
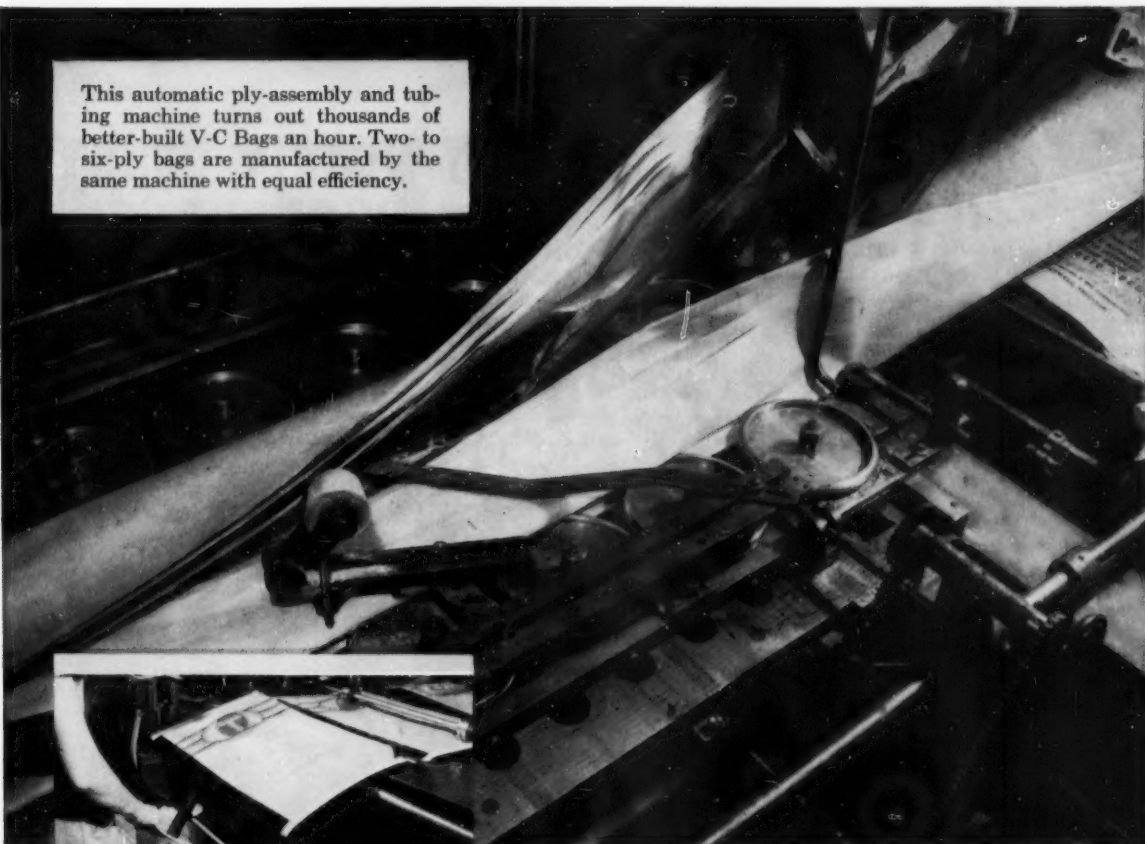
For granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 36 x 20. The standard for abrasives.



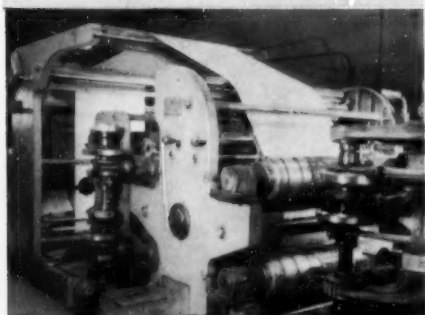
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Four-way mixing action assures a thoroughly blended product. Open-door accessibility permits easy cleaning. Available in many mixing capacities for ¼-ton per hour and up.

This automatic ply-assembly and tubing machine turns out thousands of better-built V-C Bags an hour. Two- to six-ply bags are manufactured by the same machine with equal efficiency.



After ply-assembly, tubing and cutting, comes top and bottom sewing. Operator above is inspecting finished sewn-bags as they come from sewing machine.



One of V-C's modern printing presses. Capable of printing from one to four colors, V-C presses help put "sell" in your bags and faithfully reproduce your trade design.

V-C's Modern Equipment Means Better Bags for You

The most modern methods, materials and machines are used in manufacturing V-C Multiwall Bags. This means you get the advantages of the latest developments in bag-making—some of which have been pioneered by V-C. Write for full information about V-C Bags, or discuss your requirements with a V-C representative. It will pay you to get V-C's free technical assistance.



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AS YOUR
BEST TAILORED SUIT



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DEERE \$20,000,000 PLANT NEARLY READY

Final construction is underway on the Grand River Chemical Division of Deere & Company's new \$20 million nitrogen plant located near Pryor, Oklahoma. The plant will produce anhydrous ammonia and urea for use by the fertilizer, feed and chemical industries. Ammonia production is expected in June and urea production at a later date.

L. A. Rowland, Vice President, Deere & Company, and General Manager of the Grand River Chemical Division, announced that Deere & Company's entry into the chemical field was strictly an adjunct to its traditional farm equipment business. This provides an opportunity for the company to further serve the farmer's needs and indirectly help build for a more stable national economy.

The new plant will serve the growing nitrogen demands in the broad central belt of the United States. A tremendous fertilizer potential exists in this area which promises rapid development.

It is believed that the new plant is of the most modern design in the world. Among the outstanding features are compactness and automatic control, thus reducing the normal labor requirements. A new gas oxidation and Casale synthesis process will be employed to produce ammonia, while the Pechiney process will be used to produce urea.

The plant has a daily rated capacity of 180 tons of anhydrous ammonia. The majority of the ammonia will be used to produce urea leaving the remainder to be shipped as anhydrous ammonia.

The fertilizer grade urea will be marketed under the registered trade name "Vitrea," and will be guaranteed to contain 45% nitrogen. For easy drilling and improved physical properties, the "Vitrea" will be prilled and coated with a special conditioner.

The Grand River Dam Authority will supply the plant's daily require-

ment of 2,300,000 gallons of water, 125,000 pounds per hour of steam, and the power load of 15,000 k.w. The Oklahoma Gas Company will deliver about six million cubic feet of gas per day . . . equal in approximate consumption to a city the size of Enid, Oklahoma which has a population of over 36,000. The plant is served by the Missouri-Kansas-

Texas Railroad.

A modern two-story administration and research building has recently been completed at the plant site, four miles southeast of Pryor, and is now occupied by plant personnel. The general and sales offices have been permanently located at 2010 South Utica, Tulsa, Oklahoma.

Top—L. A. Rowland, Vice President of Deere & Company and General Manager Grand River Chemical Division; W. W. Yeandle, Works Manager; John R. Taylor, Jr., Sales Manager.

Center—Model of new Deere nitrogen plant.

Bottom—Plant under construction near Pryor, Oklahoma.



What's ahead in Fertilizer Sales?

What will be the effect of acreage controls? Of diversion of crops? Of lower farm prices? Of stiffer competition?

Doane Research can help you get the answers! Here is one of the many questions and problems on which we have worked recently:

"What are the potential sales of Fertilizer by 1957, in seven North Central States?"

The answer was vital to our client, who is faced with the important and pressing decision, "Should I make a major investment to expand plant capacity?"

We serve fertilizer manufacturers by doing research in potential sales—market trends—field testing and demonstrations and in promotional and education programs. Through our more than 34 years of active management of thousands of farms, ranches and plantations, we know the farmer's problems, how he thinks, how he reacts and what it takes to sell him. No matter connected with agriculture is too big or too little for our research staff to handle.

Do You Have A Problem

—related to future sales, new types of fertilizer, distribution, advertising, selling, or educational programs on which an outside viewpoint, especially that of the consumer, is important? We will be glad to discuss it with you—without obligation. Write for free booklet describing our services. If urgent, wire or phone us.

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(crystals, prills or solution)
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plants
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MISSISSIPPI CHEMICAL PRODUCING ABOVE ITS RATED CAPACITY

The Mississippi Chemical Corporation completed one phase of their expansion program when they recently put into operation 60 additional tons per day of ammonia capacity. Within one week from the date the plant was purged for startup preparations the unit was producing in excess of its rated capacity, which brings MCC's ammonia production facilities up to in excess of 180 tons per day.

The Mississippi Chemical Corporation process for gas reforming consists of a single stage reformer operation at 15 pounds outlet pressure followed by CO conversion and MEA scrubbing for CO₂ removal. The gas is then compressed to 1000 atmospheres prior to high pressure methanation and ammonia synthesis using the Claude ammonia synthesis process.

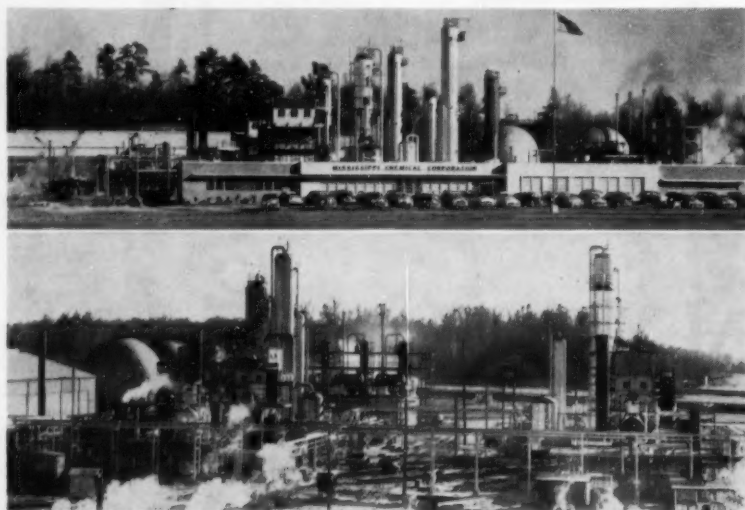
A continuation of MCC's ammonia expansion program for this year consists of constructing a low pressure methanation unit which will remove all the carbon monoxide prior to compression. This will result in additional compressor capacity as well as free the present high pressure methanator for use as an ammonia converter. This step will be followed by additional reforming capacity and compression which will ultimately bring MCC's total capacity up to in the neighborhood of 290 tons per day.

MCC also started construction the first of February on a 120 ton addition to the nitric acid facilities. It is interesting to note that practically one hundred percent of the processing equipment required for this unit has been purchased from Europe. The stainless steel processing unit itself comes from Germany where it was fabricated by the Rheinische Röhrenwerke and the compressor, a type not before used in this country in the manufacture of nitric acid, was purchased from the Brown

Boveri Company of Zurich, Switzerland.

Construction was also started in January on MCC's new ammonia ni-

trate prilling unit which will bring their total prilling capacity to approximately 500 tons of ammonium nitrate per day.



Upper picture gives a general view from the highway of Mississippi Chemical's plant with the office in the foreground, nitric acid, ammonia storage facilities in the background toward the right, gas reforming plant in the center background, and the compressor section of ammonia synthesis in the left background. Lower photograph shows the new gas reforming facilities at the right, with the nitric acid units in the center background and the old gas reforming section to the left. To the extreme left is the compressor building which was extended to handle the additional compressor capacity.

New Accessories For "Payloador"

The Frank G. Hough Co., Libertyville, Illinois, has announced accessory equipment to increase the usefulness of its Model HM 4-wheel-drive "PAYLOADER" Tractor-Shovel to many users.

One of these is a wide pusher plate for rear-mounting so that the machine can push stalled trucks and other equipment and spot railroad cars. This pusher plate also includes a retractable towing link, so that the 1-1/2 cu yard tractor-shovel can tow, haul or skid loads.

Where it is desirable to use the Model HM as a prime mover to haul hydraulic-controlled scrapers, wagons, rooters, etc., a set of hydraulic connections and valves can be installed for control of the hauled equipment.

Full details on the Model HM "PAYLOADER" and the many useful accessories available for it can be obtained from your Hough Distributor or by writing to The Frank G. Hough Co., 702 Seventh St., Libertyville, Ill.



DUK-PAK Kraft Bags

*shed water
resist abrasion
and stay cleaner!*

and A & S Duk-Pak Kraft bags cost no more than ordinary multiwall bags!

Yes, Arkell & Smiths' extensive tests prove that DUK-PAK has greater resistance to exposure, moisture and to weather — like the proverbial you-know-what!

What's more, DUK-PAK has a special, "built-in" reinforced quality which makes it resistant to scuffing and abrasion. Where ordinary multiwall bags might "give-way" under rough handling, DUK-PAK holds its own, longer. This adds up to:

1. DUK-PAK provides dependable packaging for products that don't like water, moisture, or dirt, and
2. DUK-PAK protects your brand name and advertising which appear on the package.

Let Arkell & Smiths' 95 years of packaging "know how" serve you! Our Packaging Team — specialists in every phase of the operation — are prepared to tackle your specific problem. Address your inquiry to our Packaging Engineering Department at Canajoharie, N. Y.

ARKELL and SMITHS the oldest name in paper bags

ARKELL and SMITHS

A&S

CANAJOHARIE, N. Y. • WELLSBURG, W. VA. • MOBILE, ALA.

LOCAL LEVEL ASSOCIATION NEWS

Oklahoma group has a busy year

C. F. Witter, an implement dealer of Asbury, was presented a Stetson hat by the Oklahoma Plant Food Association, in recognition of his speeches to a series of meetings held all over the State, sponsored by the association. The presentation was made by Perry Onstot, agronomist of Thurston Chemical.

The meetings, five in all, were held at Enid, Ponca City, Vinita, Muskogee and McAllister, and Witter was featured at each with a discussion of how he promotes and sells fertilizer.

The Oklahoma Association, as Commercial Fertilizer readers know, was incorporated April 15, 1953. James H. Gillie, association vice-president, has written the following statement of its aims and activities:

The agricultural colleges, fertilizer industry, fertilizer dealers and others interested in increased soil fertility, have banded together into a growing organization to improve the soils of Oklahoma.

It is a non-profit educational association which was incorporated April 15, 1953, as the Oklahoma Plant Food Association. Its purposes as stated in the charter and by-laws are:

- (1) To foster and encourage the adequate and correct use of plant foods.

- (2) To promote increased soil fertility.

- (3) To encourage soil conservation and proper cultural practices.

- (4) To co-operate with all agencies, governmental and private, in close co-ordination with Oklahoma A & M in soil building, and,

- (5) To perform such acts and things as may be proper to result in the production of better crops and increased farm income!

The Association was formed as a direct result of the Land Grant Col-

lege, U.S.D.A. program for "more efficient use of fertilizer and lime." Testimony in Washington at the time this program was being formed suggested that one of the best ways it could best be carried out was to form State associations which would work on an educational level.

In spite of the apparent present day surpluses of some crops, the Land Grant Colleges and U.S.D.A., in taking a practical look into the future, can see the continuing waste of soil fertility and the ever diminishing productive capacity of the nation's soils. According to Wesley Chaffin, and other Agronomists at Oklahoma A & M, this problem of more mouths to feed on less fertile soils is one that Oklahoma must face up to now. Bob Woodward, Extension Agronomist at the College, has estimated that Oklahoma alone needs up to 800,000 tons of commercial fertilizers and soil ammendments each year just to replace the fertility taken out by growing crops yearly. In 1953, Oklahoma replaced only slightly over 146,000 tons with commercial fertilizers.

The Association has mailed college bulletins to fertilizer and seed dealers: they have formed a speakers bureau which has already filled engagements before several interested organizations. The sponsoring of fertilizer demonstration plots, field days, fair booths and radio and newspaper awards are being planned by association members.

Joint fertilizer dealer-banker dinners have been held in Enid, Ponca City, Vinita, Muskogee and McAllister. An average attendance of 80 at each location heard George Green of the State Bankers Association, Wesley Chaffin and Dr. H. F. Murphy of the college speak. Leading farmers such as Luther Spradling of Bixby, Henry Frakes of Dawson,

local fertilizer dealers and Paul Latture of the Tulsa Chamber of Commerce discussed means of more efficiently using fertilizer and lime to increase the soil fertility and farm income in the area. C. C. Crawford of Bartlesville, President of the Association; Arnold Neuman, Treasurer, Oklahoma City and William Burch of Joplin worked with local county agents, P. M. A.'s and others in arranging for the meetings.

Memberships are of four types:

- (1) Active memberships for manufacturers and formulators of fertilizers.

- (2) Associate memberships for fertilizer ingredients and raw material supplies, and, for service agencies concerned with soil fertility, such as, banks, railroads, newspapers, chambers of commerce and others.

- (3) Honorary memberships for college people and other governmental agencies, and,

- (4) Individual memberships for fertilizer feed and seed dealers, farmers and others who believe in soil improvement. These are \$5.00 yearly memberships.

Dr. Horace J. Harper, assistant director of the Oklahoma A & M Experimental station and the area's leading soil scientist, now directing the Nobel Foundation's agricultural research program at Ardmore, has long called for a soil improvement association in Oklahoma with the majority of the participation on the individual basis. The fourth type of membership offers this opportunity for all friends of the soil to help. The participation in all types of memberships is growing rapidly but solicitation for new members will continue.

All the fertilizer companies manufacturing in Oklahoma and the many selling in the state are members along with other suppliers and service groups throughout Oklahoma.



Plant Superintendent is J. G. Bruce, Jr. whose father was superintendent ahead of him. The Bruces have a total of 61 years' service.

This modern plant is the factory of F. S. Royster Guano Co. in Bessemer, Alabama. Built in 1906, the plant burned and was rebuilt in 1928, and expanded in 1953. It supplies fertilizer to farmers of Northern Alabama, Mississippi and Tennessee.

F. S. Royster Guano Co.

... Another Spensol User



Highly specialized equipment worth millions of dollars is needed to produce SPENSOL (Spencer Nitrogen Solutions).



Spencer means service and good service has made SPENSOL Solutions a favorite with scores of nationally known mixers.



Multi-nozzle solution injector, giving better ammoniation of mixed fertilizer was invented by H. B. Davis of Spencer.



SPENCER CHEMICAL COMPANY, Dwight Bldg., Kansas City 5, Mo. District Sales Offices: Atlanta, Ga.; Chicago, Ill.; Memphis, Tenn.; Works: Pittsburg, Kans.; Henderson, Ky.; Chicago, Ill.; Vicksburg, Miss.; Orange, Texas (under construction)

America's Growing Name in Chemicals

MARKETS

ORGANICS: Demand for fertilizer organics continues rather quiet as fertilizer manufacturers have covered the largest part of their requirements during previous months. Domestic Nitrogenous producers are in a well sold position and offerings of imported Nitrogenous are light. Domestic Nitrogenous Tankage currently varies in price from \$3.50 to \$4.50 per unit of Ammonia, bulk, f.o.b. domestic production points. Imported Nitrogenous is indicated at around \$4.20 per unit of Ammonia, in bags, CIF Atlantic ports.

CASTOR POMACE: Domestic production is still indicated at about \$25.00 per ton, in bags, f.o.b. Northeastern production points but supplies are small and aggravated by water-front strikes in New York. Texas and Oklahoma Castor Pomace is available for prompt and April/May shipment at around \$14.50 per ton bulk to \$15.00 per ton bagged, depending on producers. This material is guaranteed 6.25% Ammonia.

DRIED BLOOD: This market continues at around \$8.50 to \$8.75 per unit of Ammonia, unground, in bags at Chicago and around \$8.25 at New York.

POTASH: Demand for Muriate of Potash from domestic sources continue to strengthen and Sulphate of Potash is in particularly tight supply position. Offerings of Imported Sulphate of Potash are readily being taken up for use near the ports and even for shipment to interior destinations. Imported Sulphate of Potash varies in price from 90¢ to 95¢ ex-vessel Atlantic ports.

GROUND COTTON BUR ASH: Supplies of this form of Potash, composed primarily of Carbonate of Potash, continue available for prompt and future shipment and analysis now runs about 33% to 37% K₂O. Prices are unchanged and approximating the cost of Domestic Sulphate of Potash delivered at most destinations.

PHOSPHATE ROCK: Supply position continues favorable and do-

mestic withdrawals are increasing. Prices continue steady.

AMMONIUM NITRATE: Supply of this 33½% form of Nitrogen continues short of demand. Prices remain firm and unchanged.

SULPHATE OF AMMONIA: Strong demand continues to whittle down stocks but supply also continues adequate.

NITRATE OF SODA: Movement of both imported and domestic from stockpoints, continues heavy with the demand expanding in the southeast. Prices remain unchanged.

CALCIUM AMMONIA NITRATE: Several brands of this imported 20.5% Nitrogen are available at several Atlantic and gulf ports at \$51.25 per ton, bagged, f.o.b. cars at the ports.

GENERAL: Movements of mixed goods throughout the southeast and midwest is expanding rapidly and a shortage of a few materials is developing. Triple Superphosphate, Ammonium Nitrate and Sulphate of Potash appear to be short of current demand.

PHILLIPS HEADS EQUIPMENT & ENGINEERING OFFER TVA AND EHRSAM EQUIPMENT

The election of W. W. Phillips as President was announced by the board of directors of Equipment and Engineering Co., Inc., after the February meeting. Mr. Phillips has worked with the fertilizer industry designing plants and equipment for several years.

Coinciding with his election, Mr. Phillips announced that Equipment and Engineering Co., Inc., will furnish a complete line of equipment to the fertilizer industry. In addition to belt conveyors, screw conveyors and bucket elevators, it was pointed out that complete processing units are available. Among these are automatic and manually operated batch hopper systems, batch mixing units and bagging units.

The TVA Continuous Ammoniation process has received such favorable reception by the fertilizer industry, according to Mr. Phillips, that his organization will offer this equipment. Specific studies of the pilot plant and process data at Wilson Dam, Alabama, have been made and complete designs are for several sizes and capacity units. It was predicted that several TVA units would be installed by the industry during 1954.

Appointment of Equipment & Engineering Co., Inc., as representatives for The J. B. Ehsam & Sons Mfg. Company was announced by John F. Heimovics. In making this announcement, Mr. Heimovics, Executive Vice President, pointed out that Equipment & Engineering Co., Inc., was selected because of the technical organization they possess. The Enterprise, Kansas headquarters and shops of Ehsam produce a complete line of conveying, elevating, power transmission and process equipment for the fertilizer, grain and gypsum industries.

Expansion of Ehsam's fertilizer equipment business is planned as a result of this appointment. Originally established in 1872, Ehsam has shown sound and substantial growth through the years. Their factory includes a foundry, plate, machine, screw conveyor, idler and sheet metal shops. A large engineering department is maintained to assist in the preliminary design and equipment selection with their fertilizer clients.

Headquarters of Equipment and Engineering Co., Inc., are located at 4097 Peachtree Road, Atlanta, Georgia.



DUVAL

High Grade Muriate of Potash!

DUVAL SULPHUR and POTASH CO.

Modern New Plant and Refinery at Carlsbad, New Mexico

Address all communications to:

ASHCRAFT-WILKINSON CO.

Exclusive Distributors

ATLANTA, GEORGIA

Cable Address ASHCRAFT

NORFOLK, VA. • CHARLESTON, S. C. • TAMPA, FLA.

JACKSON, MISS. • COLUMBUS, OHIO

Personals . . .

George S. Wheaton, assistant vice president of **American Potash & Chemical Corporation**, has been named head of the company's **Eston Chemicals Division**, it was announced by **Peter Colefax**, president of **American Potash & Chemical**. **Eston** products include agricultural and industrial chemicals and refrigerants.

A graduate of **Stanford University**, **Wheaton** began his chemical career with **Hercules Powder Company** in **San Francisco**, following which he played a major role in the develop-

ment of the **Eston Chemicals** business which became a division of **American Potash & Chemical Corporation** in **July, 1952**.

Kenneth W. Montfort of **Portland, Ore.**, has been named district sales manager in the **Pacific Northwest** for the **Agricultural Chemicals Department** of **Eston Chemicals Division**, it was announced by **William J. F. Francis**, General Sales Manager, **Western**, of **American Potash & Chemical Corporation**.

Elmer D. Young, who has been selling fertilizer in **Kentucky** for more than 12 years, has been elected vice-president in charge of sales of **Tri-State Chemical**, **Henderson, Ky.**

L. A. Dhonau, formerly assistant director of the **Arkansas AES** has joined **Arkansas Farmers Plant Food**, **Little Rock**, as sales representative.

Malcolm L. Wilson, former farm store operator has been made vice-president and general manager of **Southern Chemical and Fertilizer**, **Dallas**.

Donald B. Roark, professor of dairy husbandry at **Mississippi State** has become executive assistant at **Mississippi Chemical**.

Three **Stauffer Chemical** men: **Kenneth H. Allen**, director of purchases; with them since 1944. **E. William Elpper**, in market

research and development department; **Milton W. Melander**, with them since 1923, now manager of export sales division.



Fulton Bag personnel: **George Williams**, moved from **Dallas** to charge of textile and multiwall operations at **Los Angeles**, succeeding retiring **Jack Baldwin**. **W. Frank Kerr**, from **New**

Orleans to **Los Angeles** sales manager; **Fred G. Barnet** assistant at **New Orleans**, moved up to plant manager replacing **Williams**; **Louis J. Even**, **New Orleans** sales supervisor, replacing **Kerr**.



C. R. Stearns, Jr. since 1939 with Florida State Citrus Experiment Station has gone with **Superior Fertilizer & Chemical Co.**, Tampa, and will direct the pest control program in the citrus properties of growers served by Superior.

* * *

Carl Greenberg is new manager of the **Consumers Cooperative** plant in St. Joseph, Mo., transferring from their plant at Longmont, Colorado.

* * *

Two **V-C** men of the Dubuque, Iowa plant were given a very elaborate write-up in the local press recently. They are **Harold S. Vorhes**, manager and sales chief and **Walter L. Hampton**, plant superintendent. Their personal and business history was detailed from the time Vorhes threw off his football uniform at the University of Indiana, and told how they have worked as a team to build Dubuque operation through three enlargements, making it one of that city's largest shippers.

* * *

Gerard D. Baerman has been named northeast regional sales manager of the **Powell Division, Mathieson Chemical**, New York, and **A. E. Collazo** has joined the export department of the division in an executive capacity.

Mr. Baerman was formerly Northeast sales manager for **Geigy Chemical**, and prior to that was in sales work with **Shell Chemical**.

Mr. Collazo was formerly purchasing agent and export manager of the agricultural division, **Geigy Chemical**.

* * *

J. Sinclair Marks, assistant treasurer of **Davison Chemical**, has been elected treasurer to succeed **J. Early Hardesty**, who resigned recently, it was announced March 3 by the company. **Raymond S. Clark**, counsel of the company, at the same time was elected assistant secretary.

Mr. Marks has been employed in various production and financial capacities with Davison and its predecessor companies since 1929. In December 1950 he was elected assistant treasurer.

Prior to coming to Davison Mr.

April, 1954



Jim Totman, Summers Fertilizer Company, shown by one of the many reproductions appearing on the walls of the company's recently completed offices in the Totman Building in Baltimore. Completely modern throughout, the entire floor has been remodeled and air conditioned. The entrance to the offices is through an attractive and colorful reception room, the front wall being entirely of glass. On the reception room and corridor walls are pictured some of the production acres and farm scenes that are familiar to everyone in the industry. Jim is shown standing by one of his favorites.

FULTON BAG CORRECTION

In our February issue we had pictures of Clarence Elsas and Jason Elsas. Mentioning that Clarence had been elected to head the Textile Bag Manufacturers Association, we followed with the statement that Jason had been made executive vice-president. We neglected to make clear that Jason Elsas is executive vice-president of Fulton Bag and Cotton Mills, of which Clarence Elsas is president. Sorry.

Grant H. Braun, came from Libby, McNeil and Libby to Northwest for American Potash Institute, replacing George A. Wickstrom, who has transferred to Midwest.



John F. Pendergast, left, and John E. Becker, who have been appointed to the sales department of Contractors Machinery Company, Batavia, New York. Mr. Pendergast is general sales manager; Mr. Becker is regional sales manager with 14 northeastern states and Canada.





Rudolph S. Rydell, becomes president of the Smith-Douglass Coronet division, whose offices have been moved to Norfolk. He was with Swift for 17 years.



D. A. Clarke, who has been made assistant manager of the Bemis Bro. Bag Company Indianapolis plant and sales division, effective May 1. He joined them in 1938.



Donald E. Thal, now Central general manager of Link-Belt's Pacific division. He joined them in 1936.

Clark had been with the Baltimore law firm of Venable, Baetjer & Howard. In his new post he will continue as counsel.

* * *

Appointment of sales representatives for its industrial silo division in four additional cities were announced by **The Marietta Concrete Corp.**

F. Leonard Christy, sales head of the company's industrial silo division in Marietta, said the division's new sales representatives are **Mayer & Oswald**, 37 W. Van Buren St., Chicago; **Matt A. Doetsch Machine Co.**, 1625 I St., N.W., Washington 6, D. C.; **Alcar Builders Specialties, Inc.**, 1315 Buttonwood St., Philadelphia 23, and **Critz Engineering Co.**, 575 Wirham Pl., Cincinnati 20.

The division also is represented in New York City by **Squires & Cole**, in Pittsburgh by **Mann Engineering Co.**, and in Atlanta, Ga., by **J. C. Mooar**.

The new offices will supplement those already maintained at the company's branch plants at Baltimore, Md., Hollywood, Fla., Charlotte, N. C., and one that will start operations at Bowling Green, Ky., sometime in April.

Appointment of the new sales representatives is part of a general expansion program, Christy said. This includes, in addition to the new Bowling Green plant, the opening of the Hollywood plant last September, expansion of the Charlotte plant, and establishment of a new testing laboratory at the main plant in Marietta.

* * *

Arch Carswell, director and vice president in charge of sales of **St. Regis Paper Company**, was elected a director of their Canadian company to fill the vacancy created by the death of **William K. Dick**.

Hugh W. Sloan, vice president of St. Regis Sales Corporation, was elected a vice president of the Canadian company at the same meeting. Since July, 1953, Mr. Sloan has been active in the affairs of the Canadian company, with headquarters in Montreal.



Syed Amjad Ali, Pakistan Ambassador to the U.S., greeted on arrival as Chase Bag Company guest by W. N. Brock, Chase vice-president and general salesmanager.



Donald William Douglas, appointed salesman for Stockton, Cal., area and the state of Nevada for Chase Bag Company.

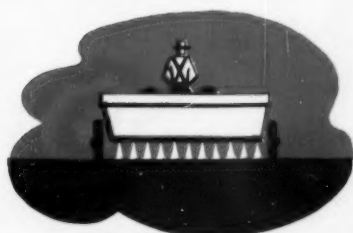


L. A. Dhonau, now sales representative for Arkansas Farmers Plant Food Company, North Little Rock, Arkansas.

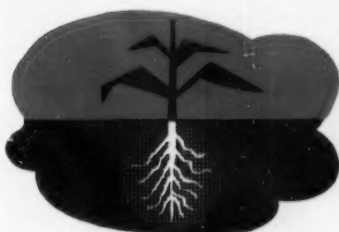
DAVISON GRANULATED Superphosphate 3WAY CONTROL



STORAGE CONTROL—No caking or lumping while in storage.



APPLICATION CONTROL—No dusting or bridging; drills free and even.



FOOD CONTROL—Supplies plant food at a uniform rate.

Now it is possible for you to store superphosphate without fear of its caking . . . that is, if it is DAVCO GRANULATED SUPERPHOSPHATE. DAVCO Granulated Superphosphate will not become hard or caked . . . it is easier to apply in the field because there is no dusting or bridging over in the drill.

DAVCO Granulated Superphosphate gives complete coverage in the field . . . drilling freely and evenly . . . supplying each plant with a uniform quantity of nutrient phosphorus.

Get DAVCO Granulated Superphosphate . . . the superphosphate that gives you the added sales points through its 3-way control.

Progress Through Chemistry

THE DAVISON CHEMICAL CORPORATION

BALTIMORE 3, MARYLAND

PRODUCERS OF: CATALYSTS, INORGANIC ACIDS, SUPERPHOSPHATES, PHOSPHATE ROCK, SILICA GELS, SILICOFLOURIDES AND FERTILIZERS

April, 1954

63

MT. PLEASANT

The story of a V-C plant, modernized

It is always interesting to read an autobiography of a person, so why not that of a fertilizer plant. That is really what this story is. It appeared in the Virginia-Carolina News a while ago, and we asked permission to print it, together with the pictures they took because we think it makes interesting reading, and suggests how all of us may keep up the morale and pride of our personnel.



Opal Hicks checks electric control board at the manipulating machine.

Interior view showing hopper scale for phosphate rock over the superphosphate wet mixing pan.



Mt. Pleasant is 2,931 persons living in modern houses of old and new design, on Highway 43, about 69 miles south of Nashville. It is rolling, green pasture and farm land, rich country, famous for its mules and Tennessee walking horses. It's also phosphate rock mining country and the home of one of V-C's 36 fertilizer plants.

There were big doings in this Tennessee town on October 14, when V-C unveiled its remodeled and enlarged fertilizer plant with an "open house." More than 200 customers, dealers, and members of the press turned out to tour the plant and inspect the new facilities. L. A. Sands, superintendent, and Brown Simmons, foreman, of the plant, along with salesmen from Birmingham, Atlanta and Cincinnati were on hand to welcome visitors, guide them through the buildings, and answer questions.

Charles T. Harding, general manager of V-C's manufacturing department, and Frank C. Richter, head of V-C's engineering department in charge of the face lifting, had worn a path between the home office and Mt. Pleasant before the final nail was driven and the last machine bolted down. They could breathe a sigh now that the plant was in full operation.

The remodeling process began practically from scratch. Everything within the four walls was ripped out. Only the outer walls remained; they to be used as the shell from which

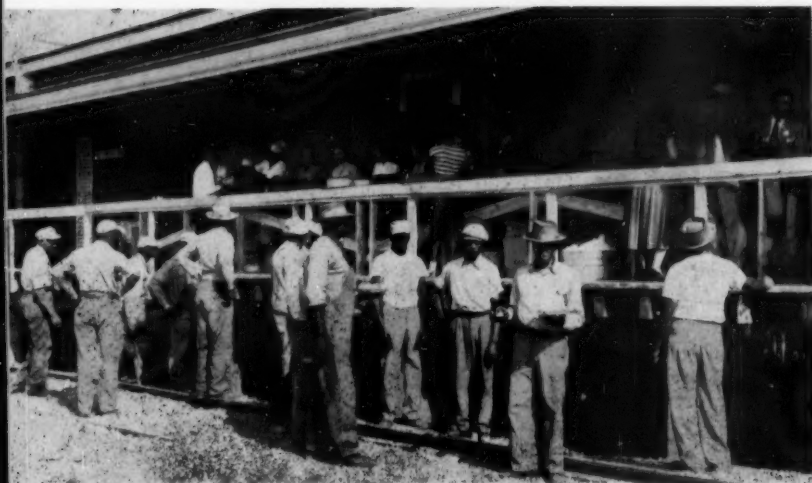
to start rebuilding. Long-leaf heart pine was specially cut and milled for the job ahead. New hoppers, elevators, manipulator and scales descended on Mt. Pleasant from all points of the map.



V-C engineers designed the tripper and trimmer shown above on one of the main belts in the storage shed.

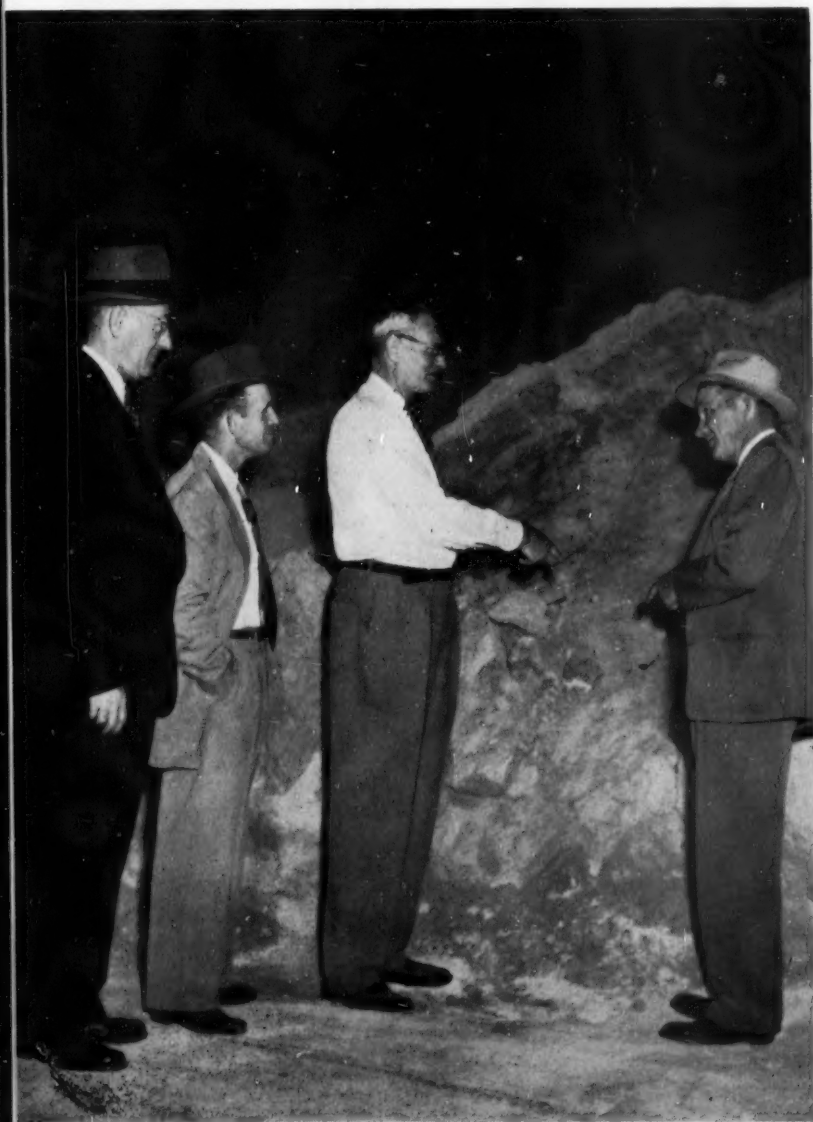
Brown Simmons, foreman, watches a car of phosphate rock being unloaded onto screw conveyor which moves the material to storage.





Employees and customers gather for barbecue lunch which was served at the open house.

Supt. L. A. Sands, center, and Bob Blakey, right, admire a pile of mixed goods in new plant while Bernhard Brinkman and customer look on.



Roy Bartlett, second from left, takes a group of visitors on a tour of the new plant.

As the construction progressed, a wide alley appeared straight down the middle of the building. Huge storage bins were built on each side of the corridor to store fertilizer and raw materials. This alleyway was made to order for the Hough "Payload" which hauls raw materials to feed a system of hoppers, elevators, and conveyors.

Meanwhile two new buildings were rising in the rear of the old structure. One houses the acidulating equipment, the other is for superphosphate storage. A new tank was built to store sulphuric acid. Finally, after months of revisions, burning of midnight oil in the engineering department, and construction, the machinery was moved in and the plant was ready for inspection.

For the fertilizer man, the modernized plant has a lot of interesting features. One particular innovation is a pile trimmer. Trying to keep fertilizer from accumulating in one spot in the storage bin has always been an irritating problem. The trimmer, brain child of V-C's engineering department, now takes care of this problem. Resembling the toy sand cars that were so popular before the days of "space men," this gadget travels up and down the conveyor, throwing fertilizer into the bin. By regulating the flow, one man can pile goods in the back, middle or front of the bin. Thus, he

Attractive....



**Hammond
Multi-Walls**

For Multi-Wall bags, "make it a habit to depend on Hammond."

HAMMOND BAG & PAPER COMPANY

General Offices: Wellsburg, W. Va.

Plants in Wellsburg, W. Va., Pine Bluff, Ark., and Charlotte, N. C.

Representatives in the following cities: CHICAGO, ILL. • BLUEFIELD, VA. • ST. LOUIS, MO. • KANSAS CITY, MO. • MINNEAPOLIS, MINN. • BIRMINGHAM, ALA. • LIGONIER, PA. • WASHINGTON, D. C. • NEW YORK, N. Y. • AKRON, OHIO • DALLAS, TEXAS • CHARLOTTE, N. C.

Brilliant multi-color printing of your brands on Hammond Multi-Walls . . . combined with the uniform high quality of papers and materials used in their production, provide you with shipping containers second to none. Manufactured to exacting standards every step of the way, Hammond Multi-Walls are attractive and strong for safe, economical delivery of your products. Consult your Hammond man today.



View of Sulphuric acid and ground rock unloading and storage area.

is able to distribute the product equally in its storage place.

On the outside of the buildings a 3-car siding provides facilities for unloading phosphate rock from gondola cars and sulphuric acid from tank cars. The rock is unloaded automatically by means of a screw which pulls the rock into an elevator where it is carried up to the top and dumped into a silo for storage.

Superphosphate is produced by mixing sulphuric acid and phosphate rock in the "wet mixer," a machine that looks somewhat like a concrete mixer. After a storage period, the superphosphate is moved to a formulating weigh hopper where it is blended with the other ingredients as mentioned in the paragraph above. Finally, a belt transports the mixed goods to an elevator which

dumps it into a system of conveyors that carry it to large storage bins.

"Payloaders" haul the plant food to the bagloading machines which automatically weigh the fertilizer, fill the bags and stitch them. Then wearing the V-C label, the plant food is ready for shipment, by truck or rail, to customers served by V-C's Cincinnati and Birmingham and Atlanta sales offices.

The office staff, housed in a separate building, wasn't forgotten in the modernization. Air conditioning, insulated ceilings and new lighting help provide a bright, airy atmosphere in which V-C employees and customers can transact business.

The climax of the day-long celebration was a big barbecue, prepared especially for the "open house" and served by the ladies of the Mt. Pleasant chapter of the Order of Eastern Star.

The Mt. Pleasant plant isn't V-C's biggest or most productive plant, but it is certainly efficient and its design incorporates the latest developments in fertilizer manufacturing.

CHEMICO PLANTS *are profitable investments*



Chemico's services cover every detail in design and construction of sulfuric acid plants, acid concentrators, complete fertilizer plants and P-A Venturi Scrubbers for fluorine fume elimination. Chemico's performance guarantees are backed up by 40 years of experience. Consultation involves no obligation.

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Specialists in

Magnesia for Agriculture

EMJEO (80/82% Magnesium Sulphate)
Calcined Brucite (fertilizer grade) 70% MgO
Calcined Magnesite 85 to 95% MgO

POTNIT

(95% Nitrate of Potash)
for

Special Mixtures and Soluble Fertilizers

Other Fertilizer Materials

INSECTICIDES — FUNGICIDES

Mercury Compounds
for Agricultural Use

DITHIOCARBAMATES

Ferric — Zinc

EXPORT — IMPORT

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Cable Address — "Berkchem" New York
55 New Montgomery St., San Francisco 5, California

For High-Nitrogen Fertilizer specify Koppers Ammonium Sulphate



GOOD COMMERCIAL GRADE

Koppers offers a good commercial grade of ammonium sulphate — the ingredient that is so essential to fertilizer because of its high nitrogen content.

CHARACTERISTICS

Koppers Ammonium Sulphate comes in crystals with low free-acid and moisture content. The nitrogen content is guaranteed to be not less than 20.5%.

SHIPMENT

From St. Paul, Minn. and Kearny, N. J., Koppers Ammonium Sulphate is shipped in 100 lb. and 200 lb. bags—also in boxcars and trucks. From Granite City, Ill. and Midland, Pa., it is shipped only in boxcars and trucks.

You'll find that Koppers Company is a dependable source of supply for ammonium sulphate. Get in touch with us concerning your requirements.

KOPPERS COMPANY, INC.

Tar Products Division

Pittsburgh 19, Pennsylvania

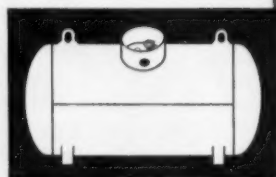
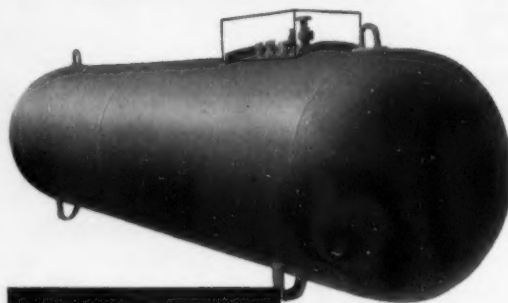


Coal Chemicals

CHARLOTTE

DUO-TESTED

Anhydrous Ammonia Tanks



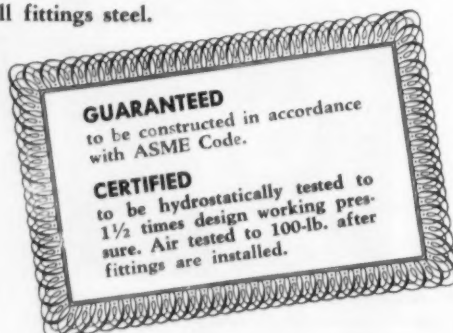
*For storage
application
and transport*

Charlotte Anhydrous Ammonia Tanks are of all-steel welded construction — 265-lb. design working pressure, UW-52, ASME Code.

Standard sizes 300, 500 and 1,000 gallon capacities for storage. 100 and 150 gallon capacity applicator tanks.

Skid and truck tanks also available.

All fittings steel.



Write today for full details and prices.



CHARLOTTE TANK CORPORATION

Post Office Box 8037

CHARLOTTE 8, NORTH CAROLINA

"HOW FARMERS GET 100% OF PARITY"

By TRUE D. MORSE
Under Secretary of Agriculture

This meeting symbolizes the way in which the agricultural problems of the Nation can be solved on a sound basis. They will not be solved primarily by the Government. The agricultural problems will be solved—and farmers will move toward more security and prosperity by teamwork of farmers and businessmen—to the extent that those who operate the Nation's farms join hands with industry and all those who serve agriculture, including Government.

Decatur, Illinois became the soybean capital of the world because the leadership saw early the future for this wonder crop. The energy and foresight with which farmers pushed forward with soybean production was matched by the aggressive development of processing, storage and selling on the part of Decatur business leaders. Witness the huge monuments to this combination in the great soybean plants of this area. They are monuments to free enterprise at its best.

Government had a part through the research and education that developed more prolific and desirable soybean varieties and improved their culture. Both industry and Government pushed forward with the research that has led to such widespread and profitable uses of the soybean.

Gainesville, Georgia put that state into the lead as the major producer of broiler chickens when farmers responded to the aggressive planning and foresight of the community leadership.

Tupelo, Mississippi has grown and the prosperity of the farmers has steadily increased because farmers and businessmen have teamed up to make long time trade-area development plans and then pushed forward

with action programs. The results have attracted national attention.

We could go on calling the roll of towns like Clarksville, Tennessee, Forest City, Arkansas, and Asheville, North Carolina, where agricultural problems are being solved by the ag-

gressive cooperation of farmers and businessmen and others working with them.

Large production from the Nation's farms helps maintain a high level of business activity, which in turn helps maintain business and national prosperity.

Labor, too, must have full employment in productive enterprises.

FERTILIZER SELLS BETTER

With a
"NEW LEADER"

MOTOR DRIVEN
SPREADER

and
WE WANT TO PROVE IT!

► A good spreading service—owned by the company, a dealer, or an individual—is the modern, easy way to sell fertilizer. Good spreading makes good fertilizer look better, while spotty and inaccurate spreading ends in spotty crop growth and an unhappy customer. If an excellent job of spreading is done, you'll sell more fertilizer. It will pay you, as it has paid so many other fertilizer companies, to actually prove to the farmer that your product will go further and do a better job if the best spreading equipment is used. Many companies demonstrate right in the field—showing a perfect pattern of just the right amount per acre—then and only then, in many cases, is the farmer sold.

► The "NEW LEADER" Commercial Fertilizer Spreader is a complete spreading service in one unit. Every inch of every acre is spread evenly and uniformly. Never too much, never too little, regardless of speed, field conditions, or changes in gear. Retaining its ability to spread in the larger quantities, this unit can spread as little as 100 pounds to the acre with complete accuracy.

► Bulk buying and handling, plus a "NEW LEADER", makes it possible for dealers to give farmers custom fertilizer spreading service at the cost of the bagged product alone.

► Available in job-tailored capacities of 4½ to 8 cubic yards.

A NATURAL CO-WORKER!



This 20-ton Self-Unloading Bulk Transport covers more territory and handles more material with fewer trips and at lower cost. The "NEW LEADER" Bulk Transport unloads either at ground level or, when equipped with optional 14-foot hydraulically-operated elevator, above the ground either into bins or spreader trucks. Available in 5 to 25 ton capacity and in lengths from 11 feet to 40 feet.

I WANT A DEMONSTRATION

Okay, show me! Tell my nearest distributor to call on me with complete proof! Also send me literature on

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☐ Bulk Transport ☐ Bulkmaster
☐ Complete Line

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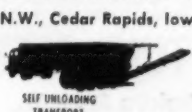
635 D Ave., N.W., Cedar Rapids, Iowa



BULK FEED and GRAIN BINS



lime and FERTILIZER SPREADER



SELF UNLOADING TRANSPORT



MATERIAL SPREADERS TRACTION-TAILGATE-TRUCK MOUNTED

Manufacturers of the World's Most Complete Line of Spreaders and Bulk Delivery Equipment

Extracts from an address before the dinner meeting of farmers and businessmen jointly sponsored by Decatur Association of Commerce and Macon County Farm Bureau, Decatur, Illinois, February 22, 1954.

When workers have good incomes it helps insure strong markets for farm products.

Those who would insist on high levels of farm prices—at the expense of unnecessary and uneconomic restrictions of production—are not acting in the best interests of farmers, labor, industry, or of the total national welfare.

Restricted production is not the road to prosperity over the long pull.

We dare not focus attention on price alone.

Farmers frequently get 100 percent of parity. Many are getting such prices now and will continue to get their fair share of the national income.

Hog prices are about 120 percent of parity and have averaged 100 percent of parity or more for 10 out of the past 12 months.

Corn sold through hogs, with the addition of labor and other charges, is bringing about \$2.50 cents per bushel or 139 percent of parity. Wheat if sold through hogs will bring 100 percent of parity.

There has been no time in the last 13 months when farmers could not have sold their corn for 100 percent of parity if fed to hogs by doing the necessary labor and providing equipment.

It is not proposed to perpetuate a farm program that discourages free enterprise and self help.

Production of high quality products is another way that farmers get 100 percent of parity or more.

Wool as a strategic material is supported at 90 percent of parity but better grades bring far above the average.

Progressive dairy farmers know the premiums paid for fluid milk for city markets. There are great deficit areas in the South, Northeast and Western states where there are dependable high price markets for milk.

Farmers producing eggs had a profitable year in 1953—eggs are now 104 percent of parity and a year ago were at 101.

An outstanding example is the current extreme shortage or durum

wheat which is selling 37 percent or nearly \$1.00 per bushel above the general average price of wheat.

The average of prices for all farm products is 92 percent of parity. It is not too difficult for capable farmers to pick up the other 8 percent, by producing what the market wants, producing high quality products, and by timing sales to get the higher prices for the year.

Howe Catalog Describes Railroad Track Scales

A 14-page two-color catalog just released, illustrates and describes the complete line of modern, heavy-duty Howe Four-Section Straight Lever Railroad Track Scales for weighing carload shipments at railroad yards and manufacturing plants.

Complete specifications for models are listed, ranging from 60 tons per section to 200 tons per section, and in various sizes and lengths.

For further information, write for a free copy of Form 685, The Howe Scale Company, Rutland, Vermont.

Are you planning to install or repair a NITROGEN SOLUTION SYSTEM

You ought to know Joe

**Call, Write or Wire JOE NAYLOR
V. P. at J. M. TULL METAL & SUPPLY CO., INC.**



FOR 20 YEARS Joe has been on the job analyzing and correctly specifying your Nitrogen Solution Fitting requirements. He will keep you out of trouble in assembling your Nitrogen Solution equipment and insure your securing the right type and amount of material to do the job correctly.

SEND FOR BOOKLET "The Installation and Operation of a Nitrogen Solution System" to P. O. Box 4628, Atlanta 2, Georgia.

J. M. TULL METAL & SUPPLY COMPANY, INC.

285 Marietta St., N.W.

AL 3871

Atlanta 3, Ga.

"C" -man...

RELY ON THE

The famous "Cutty Sark" built in 1869 set a record of 363 miles in one day. Twenty-two years before this clipper sailed the China seas, the Chase Bag Company set out on a never-ending journey—a continuous search for better packaging products.



Backed by 107 years of packaging experience

It costs you nothing, yet it's apparent in every Chase Bag...over a century of experience. The know-how is reflected in the sound recommendation of every "C" man, your capable Chase representative.

Oldest of all bag companies, Chase guards its reputation jealously. Today, every packaging

product that carries this respected name is the result of a 107 year search for perfection...the best materials, the finest workmanship, the fairest prices, the best service.

You cannot put your packaging problems in more capable hands. You cannot put your product in better bags.

over
a century
of know-how is
behind
every **CHASE**
MULTIWALL
BAG



Low Cost Protection For Your Product

The modern low-cost way to protect your product is to package it in Chase MULTIWALL Bags. It's the economical package with all these features:

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Available from 2 to 6 plies—Sewn Valve, Sewn Open Mouth, Pasted Valve, Pasted Open Mouth.

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30 BRANCHES AND SALES OFFICES—STRATEGICALLY LOCATED

TEST FOR AVAILABLE SOIL NITROGEN

EMIL TRUOG
Department of Soils,
University of Wisconsin

Details of the test procedure follow:

Fill a $\frac{1}{4}$ teaspoon measure (kitchen type) level full with 20-mesh soil (approximately one gram of silt loam) and place this soil in a regular 800 cc. Kjeldahl distilling flask. Add one gram of a mixture consisting of 20 parts of potassium permanganate and 80 parts of anhydrous sodium carbonate. (This latter may be measured with a standardized $\frac{1}{4}$ teaspoon measure, level full.) Then add 150 cc. of ammonia free water, washing down any soil or reagent mixture sticking in the neck of the flask. To prevent difficulty from excessive foaming, add a piece of paraffin about the size of a pea. When many determinations are being made, foaming can be controlled more satisfactorily by applying a coating of "Silicone" (Dow Corning stopcock grease) to the inside surface of the upper two-thirds of the bulb of the flask. Application is made by means of a swab attached to the end of a stiff wire. Place the flask on a ringstand and connect to a condenser. Bring to boiling with a flame or electric heater (Precision RH type with rheostat control works very well) adjusted to do this in exactly five minutes, and then continue the boiling for five minutes more, catching the distillate which contains the nitrogen liberated as ammonia in 10 cc. of ammonia free water. Dilute the distillate with ammonia free water to about 40 cc., add 2 cc. of Nessler's solution, dilute to 50 cc., mix thoroughly, and compare color with a standard containing 1 ppm. of N as ammonia, using regular Nessler comparison tubes. Each cc. of standard that it takes to match the whole 50 cc. of unknown represents one pound per million of soil, or two pounds per acre of available

Pounds per acre nitrogen found by test	Interpretation in terms of relative amounts of available organic nitrogen	Pounds per acre of fertilizer nitrogen needed		
		For small grains	For 100-bu. corn crop	and garden crops For potatoes and many other truck
0-75	Very low	50 to 100	200 to 250	175 to 225
75-150	Low	25 to 50	150 to 200	125 to 175
150-225	Medium	0 to 25	100 to 150	75 to 125
225-300	High	None	25 to 100	25 to 75
Over 300	Very high	None	0 to 25	0 to 25

When manure (10 tons per acre) or legume sod is plowed in, each will reduce the needed application per acre of fertilizer nitrogen by about 50 pounds. On the average, it may be assumed that of the organic soil nitrogen found available by the test, 40 per cent may be absorbed by the first crop that follows; similarly, of nitrogen applied as fertilizer, it is about 60 per cent, and of nitrogen applied in manure, about 30 per cent. Thus, by knowing the amount of available nitrogen in the soil, and how much the expected or desired crop must absorb, one can calculate the amount of nitrogen that must be applied as manure and/or fertilizer.

nitrogen. If 25 cc. of the unknown are used in the color comparison, then each cubic centimeter of standard required represents 4 lbs. per acre. Results obtained are tentatively interpreted as follows:

When manure (10 tons per acre) or legume sod is plowed in, each will reduce the needed application per acre of fertilizer nitrogen by about 50 pounds. On the average, it may be assumed that of the organic

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PRECISE ORTHOPHOSPHATE DETERMINATION

Until now the precise determination of phosphate in rocks, bones, teeth, fertilizer, and other materials has been a difficult and time-consuming process because both gravimetric and volumetric methods require the complete separation of calcium and other interfering elements. The more rapid colorimetric procedures, while adequate for most routine purposes, do not have the precision that is often required. Recently, Drs. Allen Gee and V. R. Dietz at the National Bureau of Standards developed a rapid one-step procedure for orthophosphate determination which combines the essential simplicity of a spectrophotometric method with the precision of careful gravimetric analysis. Their work was done in connection with a research program sponsored at NBS

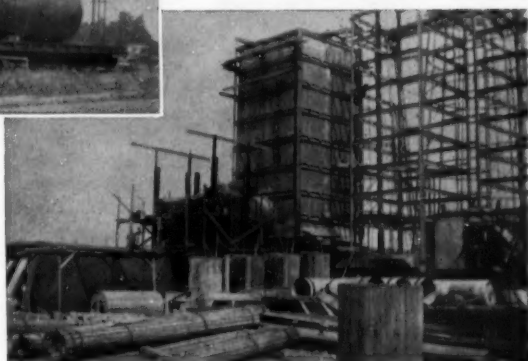
by the Sugar Research Foundation, Inc.

The proposed method uses the techniques of differential spectrophotometry, but some refinements have been introduced. The method is based on the yellow complex (molybdivanadophosphate) formed when phosphate reacts with a mixture of molybdic and vanadic acids. Solutions of the yellow complex are made up to high absorbancy (less than 1 percent transmission) in the near ultraviolet, and their absorbancy is compared with that of solutions containing known amounts of phosphate. While the absorbancy of the yellow solutions changes measurably with standing, this source of error is eliminated by comparing solutions developed simultaneously.

The procedure employs the Beckman DU Spectrophotometer with an incandescent lamp, a wavelength setting at 390 millimicrons, and a

* Simplified equipment for making this test including standard color plate may be obtained from Hellige, Inc., 877 Stewart Avenue, Garden City, New York.

* For further details see Determination of phosphate by differential spectrophotometry, by Allen Gee and Victor R. Dietz, Anal. Chem. 25, 1320 (1953)



... Lead Lined Equipment or Construction of Complete Acid Plants

SOUTHERN LEAD BURNING COMPANY

P. O. Box 4627

ATLANTA 2, GEORGIA

Tel. Walnut 2576

slit opening of about 1 millimeter. The selection of this wavelength permits the use of the glass filter supplied with the instrument to take out the stray light of wavelengths above 400 mu, which must be completely eliminated.

In practice, aqueous solutions of ammonia molybdate and ammonium metavanadate, as well as a standard phosphate solution containing perchloric acid, are prepared in advance and kept on hand. When a phosphate determination is to be made, the unknown material, ordinarily dissolved in hydrochloric acid, is diluted with water. Aliquots of this solution are taken which contain amounts of phosphate varying over a small range—say, 4.5 to 5.5 milligrams of P_2O_5 per 100 milliliters of final volume. At the same time the standard phosphate solution is used to make up two or three standard solutions covering this range. A solution containing the appropriate amounts of ammonium molybdate, ammonium vanadate, and perchloric acid is then added quick-

ly to each flask which holds the unknown or standard solution, and the remaining volume is made up with water. A 1-cm absorption cell is filled with the lightest-colored solution, and all other solutions are successively placed in a second cell and compared spectrophotometrically with the first solution. The phosphate content of the unknown solutions is interpolated from the absorbancies and known phosphate contents of the standards. A linear extrapolation for measurements not bracketed by the standards can be made, though with somewhat reduced precision.

Under optimum conditions concentrations can be compared by this method with a precision of 1 part in 3000. Results are thus comparable with the best gravimetric procedures. With proper dehydration of silica, NSB standard phosphate rocks can be analyzed to an accuracy of 1 part in 1000. Since few substances (notably silicate and arsenate) interfere appreciably with the absorbancy measurement, the procedure should have rather wide application. NBS

experiments indicate the possibility of adapting the process to various types of analyses.

Members Prefer NFA Name

A ballot, just counted by National Fertilizer Association indicates that the members are in favor of keeping that name for their association. When it came to the question of meetings, they also agreed that only one meeting a year was needful. But they split right down the middle on whether that meeting should be held in the Summer or the Winter.

The Board, meeting at the Summer convention in June, will consider these votes, and come to a definite conclusion.

Lightfoot Joins Lummus Company

C. E., "Todd" Lightfoot has joined The Lummus Company, designing engineers and constructors for the Petroleum and Chemical Industries as chemical consultant.



At right, Advertising Manager Bob Nash, Federal Chemical Company, Louisville, covers a part of Federal's advertising program with Bill Hardin who just recently joined Federal's sales staff in Louisville.

SAFETY

(Continued from page 41)

Nature, which account for 78% of all accidents.

Phychiatrists tell us that "you just can't change human nature."

If we could change human nature, we might make it better, or more reasonable, or more intelligent. Since we cannot change it, we should try to understand it, as we must live and work with it.

Let me give you a comparison. We do not expect anything from a machine which is not in keeping with its specifications. If something goes wrong, we do not blame the machine, but the people who produced it. We do not say that the machine is dumb, uncooperative, lazy, or lacks initiative. We don't discipline it, lay it off, or fire it. We Stop It, and take it apart to see why it does not perform as it should. We correct what is wrong, install new parts, and put it back to work as quickly as possible.

On the other hand, we make demands of People and expect things of them, usually without having any idea of their individual qualities, capabilities and limitations—without knowing their Human Specifications. Then, when they do not come up to our expectations or give us what we need or demand, we call them dumb,

uncooperative, lazy, etc. We do not stop the Man as we did the machine, take him apart somehow, someway, and try to find out what is wrong, correct it, and put him back to work as quickly as possible. No, we do not give the Man the same consideration we did the machine, because we think that his human nature should prevent mistakes and breakdowns.

Our own human nature is especially peculiar in that we reason fairly about things, but not about People. Nor do we reason so well about ourselves. We know, but we forget, that Good Men just like Good Machines often have no control over the things that happen to them, which prevent them from being as good men on the job as we would like them to be, or even they themselves would like to be and could be under the right conditions. Their human specifications may not fit them for the job they are doing. In other words, they may be a square peg in a round hole.

Remember the old statement, before compensation, "kill a man, hire another; kill a mule, buy another." In our safety program today, it is our goal to "save the man, avoid hiring another; repair the machine, delay buying another."

You cannot legislate a mind. Studying, teaching and training are the only answers to safe practices. Some people are dangerous and ac-

cident prone in jobs requiring rhythmic coordination. Some are handicapped emotionally, others mentally, others physically, and any one or all of these handicaps makes the man more liable to accident unless such handicap has been taken into careful consideration in making job assignments. Of course, people who are physically or mentally incapable of keeping up with job demands are unsafe and surely inadequate workers. No amount of instruction, warning or discipline can change such handicap. No amount of discipline will make a man stable, or put a brain between his ears, or give him a new leg, or return his sight.

So, the first major problem is founded on the physical, mental and emotional inadequacies of People, which just cannot be changed. Remember that we too are People, and you and I are not perfect. We have our own inadequacies, which perhaps are not realized by us, but they are there nevertheless. These inadequacies are chiefly responsible for the 78% of accidents due to People. We have heard it said that even this 78% should be higher, nearer 88%, and the 20% of accidents due to conditions should be nearer 10%.

We should put much more stress on the training of a man for the job he is to do. You have heard the saying—"if the pupil has not learned, the teacher has not taught." What would you expect if you should ask a man to cut a piece of glass who has never seen glass cut, and has never had any instruction? If you left this man alone to cut the glass under such conditions, I would suggest that you carry a basket on your return, with which to pick up the chips. Yes, we must teach the man how to do the job.

Of course, it is necessary to protect the man as much as possible, not only by training him to do the job correctly and warning him against danger, but also by using every precaution possible for his safety such as covering gears, guarding belts, etc. We must do everything humanly possible to protect his life, not only for his own sake but also for the sake of his family and others who love him.

The second major problem is "knowing the job". We, ourselves, should know the operation from A to Z. We should not kid about the worker, criticize him, or take advantage of his position. If we do not know the job thoroughly ourselves, we cannot expect the worker to know it. We should praise his efforts, as everyone needs praise and build-up. A little praise gives a person more confidence, and certainly makes him happier and more willing to do things he is asked to do. Do not reprimand a worker before other workers. None of us are perfect, but we do not like to have our weaknesses or shortcomings known by others. Defensive behavior indicates that the man is unsure, and perhaps hungry for re-assurance or praise. He needs these things in order to produce his best, and we must never be too busy to explain or instruct him just how the job is to be done.

People also want to know about things that are happening around them. Oftentimes a false rumor is started that does much damage, when just a short explanation by someone who knows the true facts would stop it. They should be given correct information.

One of the most important and most neglected phases of our safety program is follow-up. After an unsafe practice has been stopped, and because we know the job, and have studied the man, and explained all the necessary details to him, we think that is all that is required. We forget that many people have to be reminded of unsafe practices from time to time, because perhaps they may have grown careless or indifferent. Because of this inade-



quacy in people, we must have discipline. Strict and regular discipline, mental and moral training are necessary, because many people simply do not look ahead. Most of us are not gifted with applied foresight. Many people disregard safety rules which interfere with what they want to do at the moment. They adjust machinery while it is in motion, in spite of all instructions and warnings given them. They remove guards which are not welded on, which might interfere with their oiling of machinery. They forget to lock out a switch, which might cause the loss of life of a fellow-workman, because they forgot. They fail to put on goggles, because they didn't

Mike Ellison, immediate past chairman of the Southern Safety Section should be mighty proud of the safety record of Mississippi Chemical, where he presides over safety matters: They turned in a record of 326,406 man-hours in 385 calendar days without a lost-time accident.

want to take the time, thinking it was a rush job. Hurrying and not thinking are two phases of our safety program that we must strive to overcome.

Unless we realize these facts and do the very best we can to analyze and correct them, the 78% human nature problem will continue to mar our safety records, our workmen, their families and society.

March Safety Bulletin To All Smith-Douglass Plants

Now that we are in the busy season of the year it is all the more important that every possible precaution be taken to prevent industrial accidents. Everyone admits that production is of supreme importance in the fertilizer industry at this particular time of the year. Working safely is one way to speed up the net production of your plant. Much valuable time and tonnage is lost every time an accident occurs. Both quantity and quality production are affected adversely by every accident that takes place in your plant. This fact has been proved time and time again by careful and exhausted studies conducted by DuPont, General Motors, General Electric, and many of the larger and more successful manufacturing companies.

When the roll is called—on July 31, the end of the Smith-Douglass fiscal year, it is a safe bet that the plants with the best Safety Record will also have the best production record. Watch out for those "eye injuries." See to it that all workers, assigned to jobs where safety goggles should be worn, wear them.

By Vernon S. Gronto



For your lead requirements!

CHEMICAL, ANTIMONIAL AND TELLURIUM

sheet lead and lead pipe

Evans Metal Company

Box 97 Northside Station • ATLANTA, GEORGIA • Elgin 4338

SAFETY CASE HISTORY

By FRANK KRUCK, Safety Inspector
Virginia-Carolina Chemical, Richmond

This is a case history of an accident which occurred in one of our fertilizer plants.

The accident report which was mailed to our General Office stated that the accident occurred when the injured worker stepped down off a fertilizer pile onto a barrel of which he thought the lid to be secure. By so doing, the lid turned over and the injured fell in, or slid in.

On inspection of this plant and investigating this particular accident, we find that this worker did not think he was hurt very badly and did not make any report of the accident at that time. The following morning, however, he reported to the Assistant Superintendent his accident, stating

that it hurt him so bad all night that he could not sleep any at all and that he could hardly get out of bed that morning. He was sent home at once and told to stay there until the doctor could get there. When the doctor arrived and saw the condition the man was in, he had the patient sent to the hospital and after examining him, found that he had severely injured his lower abdomen, right side, and thigh of his right leg. He urged an immediate operation to prevent a serious condition from arising. This was done and the injured worker is now well on the road to recovery. (Is back at work) 51 days lost time.

Cause for above accident—poor housekeeping by:

1. Placing an empty grease drum with top not securely fastened down on platform inside of fertilizer building and too close to bulkhead.
2. Failure of foreman to instruct his men to keep all empty barrels or drums off of platform and away from bulkheads inside of fertilizer building.
3. Employee could have stepped down from where he was standing to floor without putting his foot on top of this drum.

To prevent a similar accident from occurring—

Remove all empty barrels of any kind from loading platforms and platforms inside of fertilizer building where they could possibly be used by an employee to stand or step on. (Insist that all accidents be reported at once.)



Farmers depend on ARMOUR FERTILIZERS

For more than 50 years Armour fertilizers have been "making every acre do its best". Farmers know that Armour's highest-quality fertilizers are made right and cured right to give best results with all crops.

Every bag of fertilizer sold by Armour is backed by years of painstaking scientific research in the fields of chemistry and farming. Testimonials from every section of the country—on all types of crops—prove that Armour fertilizers make increased yields of better quality crops that bring higher profits.

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with an 80 year reputation for reliability in quality, price and delivery.

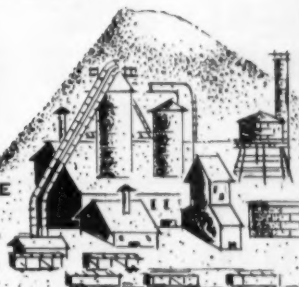
POTASH

MURIATE
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SULPHATE OF AMMONIA
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WHEN LOADING BULKY OR "PACKED" MATERIALS**

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**DIGS IN WHILE
STANDING STILL!**

A HIGHLY MANEUVERABLE POWER SHOVEL

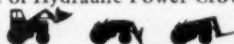
Lessmann LOAdALL scoops up big loads of the most heavily compacted ingredients or finished fertilizers . . . does it in 5 seconds while standing still! Extra hydraulic cylinders supply Hydraulic Power Crowd. This means loading with hydraulics which eliminates ramming and spinning of wheels . . . minimizes repairs, reduces maintenance! Dozer blade is easily attached for yard maintenance. Crane-hook, lift forks, snow and trash buckets are also available.

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LOAdALL has clearance for the highest trucks, bins and mixing hoppers. It loads or unloads at any height from 12" below wheel level to 108" above. Wheelbase of 73" and 12' turning radius make it highly maneuverable.

52" REACH

Here's a full 4'4" reach at maximum clearance! LOAdALL carries load close but quickly boosts it 'way out ahead' for easier loading . . . another advantage of Hydraulic Power Crowd.



Check these features!

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- ✓ **SAFETY.** Operator has unrestricted visibility and is protected from loader arms.
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O B I T U A R I E S

Henry Aaron, district manager, International Minerals and Chemical, Shreveport, La., March 25, of a heart attack.

James E. Hale, Planters Warehouse and Loan Co., Fitzgerald, Georgia, February 9.

Rollin Sherwood Jones, 67, since 1908 with Wilson & Toomer, Jacksonville, Florida, and for many years their executive vice-president, died March 15, in a Jacksonville hospital after an illness of many months.

J. J. Kerns, 71, former credit manager for Armour Fertilizer, March 23 at his home in Orlando, Florida.

Douglas W. Lloyd, 37, salesman for Virginia-Carolina Chemical, March 15.

Charles Henry McDowell, 86, former vice-president and director of Armour & Co. and retired president of Armour Fertilizer Works, March 4 in Orlando, Florida. He was a past president of National Fertilizer Association.

Derry B. Osborne, 91, former manager of the Armour Fertilizer plant in Atlanta, Georgia, April 2 after an illness of several weeks.

Allie M. Wilder, 48, assistant sales manager Fulton Bag & Cotton Mills, and with them for 20 years, died April 4 at his home after a four month illness.

BOOKS

The University of Georgia announces the release of "A Century of Georgia Agriculture, 1850-1950, by Willard Range, Department of Political Science, University of Georgia. List price \$5.00.

This book represents the first attempt to give Georgia agriculture a comprehensive treatment over a period as long as a century. It provides a historical account of the major developments during the years

1850-1950 and emphasizes the political, economic, and educational influences that changed the agricultural pattern in the state.

The material is divided into three parts: (1) The End of the Golden Age, 1850-1865, describing antebellum agriculture at its peak as well as the process and extent of its destruction by the Civil War; (2) The Long Depression, 1865-1900—a period characterized by a search for ways to restore prosperity to the state's agricultural system; (3) The Revolutionary New Century, 1900-1950, in which Georgia agriculture underwent rapid development in mechanization, diversification, and application of scientific methods.

George H. King, associate director of the Agricultural Experiment Station, University of Georgia, in his foreword to the book, says, "The author of this volume has shown a fine sense of values in the selection of material and has skillfully mixed the woof and the warp in such a way as to make an interesting pattern of the agricultural changes which from 1850 to 1950 have affected the economy of this country so profoundly."

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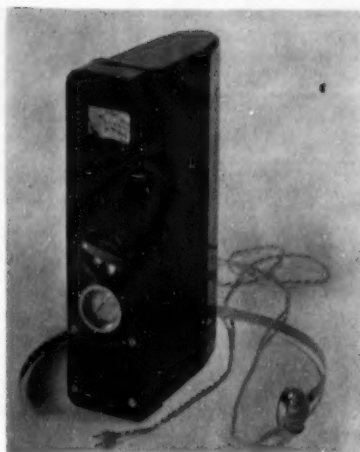
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A new, Norelco light-weight radiation detector that easily fits a man's pocket is available from the Research & Control Instruments Division, North American Philips Company, Inc., 750 South Fulton Avenue, Mount Vernon, N. Y. The unit is approximately 1.7 inches thick, 4.1 inches wide, 6.6 inches high, weighs about 25 ounces and is designed for locating sources of beta and gamma radiation. It is useful for measuring radiation exposure of laboratory workers and for checking intensity levels during research investigations, with radio-active sources and tracers.

BALTIMORE SAFETY MEET TO BE HELD MAY 7

The Governor's Safety-Health Conference and Exhibit will be held at the Lord Baltimore Hotel, Baltimore, Maryland, May 6th and 7th. On Friday, the 7th, there will be an all day Fertilizer Plant Safety Session which promises to be even better than the very successful sessions held in 1952 and 1953. Registration is free, and there are no session attendance fees.

While the detailed program is not yet ready for release, it will follow the following pattern.

Beginning at 9:30 A. M. the program will open with a talk by a prominent member of the fertilizer industry, followed by a talk and demonstration of working models that can be effectively utilized in training employees to work safely. The morning session will conclude with a fertilizer visual safety education demonstration by Tom Clarke, administrative assistant, G. L. F. Soil

Building Service, Terrace Hill, Ithaca, New York, who is also vice-chairman of the Fertilizer Section, National Safety Council and editor of the Fertilizer Safety News Letter.

After luncheon the meeting will open with a brief report by Vernon Gornto, manager, insurance department, Smith-Douglass Company, Inc., Norfolk, Virginia, and general chairman, Fertilizer Section, National Safety Council.

The major portion of the afternoon session will be devoted to a case history panel discussion. Six members of the fertilizer industry will report case histories of accidents; what happened, the causes and what was done to prevent recurrences, followed by discussions and questions and answers from the floor.

If time permits a resume of accident facts collected from the in-



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A specially constructed duplex siftproof bag with an automatic type of bottom construction is now available to insecticide manufacturers. Union Bag and Paper Corporation, who developed this bag, reports that it meets all ICC requirements for shipments of insecticide.

The advantages of this new package over the more conventional type of insecticide bag lie in its flat bottom construction. Easier to open and "square out" the bags will stand up during conveyor belt packing. This special bottom construction also makes the bags easier to display at the retail level.

Union automatic type siftproof bags come in a range of sizes (three to seven pounds) and can be printed up to four colors.

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dustry over the past two years will be presented to the group.

Wayne High, manager of operations, The Baugh Chemical Company, Baltimore, is chairman and A. B. Pettit, supervisor, industrial health and safety, The Davison Chemical Corporation, Baltimore, is vice-chairman.

Wayne is chairman of the Statistics and Contests Committee and a member of the Executive and Engineering Committees of the National Section.

A. B. is past general chairman of the Executive Committee, is chairman of the Engineering Committee and a member of the Executive Committee of the National Section.

All attending are invited to attend the Governor's Banquet which closes the conference Friday night.

N. C. Safety Conference May 6

The fertilizer section of the North Carolina Statewide Safety Conference will hold its meetings May 6 at the Sir Walter Hotel, Raleigh. There will be two sessions; morning at ten, afternoon at two-fifteen, both presided over by Hugh Surles, Planters Cotton Oil, Rocky Mount.

There will be a large exhibit of safety equipment in the hotel during the meeting.



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THREE YEAR PLAN FOR FERTILIZER SAFETY MEN

The Fertilizer Section of the National Safety Council is to establish a Three Year Plan. Vernon S. Gornto, general chairman of the Fertilizer section has named a special committee to draw up such a plan.

John E. Smith, safety director for Spencer Chemical Company, and the immediate past general chairman of the Fertilizer Section, has been named chairman of this special committee. Thomas J. Clarke, personnel director of C. L. F. Soil Building Service, Ithaca, New York; Curtis A. Cox, assistant manager, manufacturing department, Virginia-Carolina Chemical Corporation, Richmond, Virginia, and F. Wayne High, production manager of The Baugh Chemical Company, Baltimore, Maryland, are the other three members of the committee. Stewart A. Washburn, senior engineer, National Safety Council, Chicago, Illinois, and the Staff Representative for the Fertilizer Section, will serve as a special counsel to the committee.

Chairman Gornto has requested the committee to proceed at once to draft a Three Year Plan. In discussing the Three Year Plan, Gornto stated that it is his idea to adopt a definite plan, which will include all the major objectives which the Fertilizer Section hopes to accomplish within the next three years. The committee will assign a priority to each of the objectives and are to be made a part of the Plan . . . in other words, "place first things, first."

At the Congress Meeting of the Fertilizer Section last October,

Chairman Gornto set 16 Goals as the immediate objectives of the Fertilizer Section. When questioned about the 16 Goals recently, Gornto stated that several of them had already been achieved, and that most of them are well underway. He prophesied that all 16 Goals will have been accomplished by the time of the next Congress Meeting of the Fertilizer Section in October.

The Three Year Plan Committee will accomplish most of its work by correspondence. A meeting of the committee will be held at the Greenbriar Hotel, White Sulphur Springs, West Virginia, on Saturday, June 12. Chairman John Smith will submit the Three Year Plan as recommended by his special committee to a meeting of the Executive Committee of the Fertilizer Section on June 13. The Executive Committee will also hold their meeting at the Greenbriar Hotel at White Sulphur Springs.

Cox In Ike Safety Conference

Curtis Cox, chairman of the fertilizer section, has been invited to attend President Eisenhower's conference on occupational safety, in Washington, May 4-6.

Details On A Map Item

On page 43 of this issue there is a brief item on the decision of the Lake Charles, La., Harbor and Terminal District to construct a phosphate rock grinding plant. Just as we went to press came a letter from Port

Write Ryker

In our February issue we credited the material on DuPont experiments with seed pelleting to George H. Soule, who supplied us with the data. He wishes it cleared up that Dr. T. C. Ryker of DuPont directed the field test program. The many readers who have asked for more information on this subject may wish to write Dr. Ryker for more detail, at DuPont, Wilmington 98, Delaware.

Director E. J. Christman, who tells us more about the project.

According to Mr. Christman, the plant will consist of eight silos of approximately 2,000 ton capacity and two grinding mills with anticipated capacity of thirty hourly tons. They hope this plant will serve the mixed fertilizer interests of Lake Charles, western and northern Louisiana, northwest Texas, parts of Oklahoma and Arkansas.

Moving rock by rail to Tampa and barge to Lake Charles is expected to make a considerable saving, which will be reflected in the price of the ground rock to the ultimate consumer.

Thomas & Son Appoints Philipp Brothers

I. P. Thomas & Son Company, Camden, New Jersey, announces appointment of Philipp Brothers Chemicals, Inc. as exclusive selling agents for their production of triple superphosphate. Sales of this product will be directed by K. D. Morrison, general manager of the agricultural chemical division of Philipp Brothers Chemicals, whose head office is located at 37 Wall Street, New York 5, New York.

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SALESMAN WANTED: Wanted salesman for pelleted, mixed fertilizer in Kansas-Oklahoma area. Prefer experienced young man, under 30. Reply box No. 27, c/o Commercial Fertilizer, 75 3rd St., N. W., Atlanta, Ga.

WANTED: Experienced trader in Fertilizer Chemicals by a reputable firm of 30 years standing in the Fertilizer business. Please send references and experience to Box #28, c/o Commercial Fertilizer, 75 3rd St., N.W., Atlanta, Ga.

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